BULLETIN OF MISCELLANEOUS INFORMATION Appendix I 1928
ROYAL BOTANIC GARDENS, KEW

REVIEW OF THE WORK OF THE ROYAL BOTANIC GARDENS, KEW, DURING 1927.

General.

STAFF.—During 1927 the following appointments were made :— Mr. H. C. Sampson, C.I.E., B.Sc., as Economic Botanist ; Miss M. B. Moss, B.Sc., as Temporary Botanist in the Herbarium, in succession to Mr. J. E. Dandy, B.A., appointed an Assistant in the Department of Botany, British Museum (Natural History).

Miss I. C. Verdoorn, of the Division of Botany, Department of Agriculture, Pretoria, who has acted as Assistant for South Africa in the Herbarium during the past two years, returned to South Africa in December, on termination of her period of duty at Kew.

Dr. J. M. Dalziel was absent the first four months of the year on special leave, accompanying Dr. D. Fairchild, Chief of the Foreign Seed and Plant Introduction Office of the U.S. Department of Agriculture, with the Allison V. Armour Expedition, 1926-27, to West Tropical Africa.

EMPIRE MARKETING BOARD.—During the past year Kew has been brought into intimate relation with the Empire Marketing Board. At first sight it may appear that there can be little in common between botanical research and commercial enterprise. The policy of the Board has, however, been conceived on broad lines, and a leading feature of that policy is the scientific and economic investigation of the resources of the Empire. In this investigation, so far as plant products are concerned, Kew has been continuously occupied for upwards of three-quarters of a century.

The following extracts from a Report dated June, 1927, "A Year's Progress," define the policy of the Board in this particular aspect :—

"The best service that can be done to the Empire producer is to place freely at his disposal the resources of science and economic investigation."

"The Board has made no attempt itself to engage directly in scientific research. Its proper part was seen clearly from the outset to be that of fortifying existing scientific institutions in such measures as would enable them to intensify or develop their work and of making possible the establishment of new institutions to meet new and proven needs."

In its well-advised decision to avail itself of the assistance of existing institutions qualified by tradition, experience and equipment to further the ends in view, the Empire Marketing Board has naturally enlisted the services of Kew, and has made, through the Ministry of Agriculture and Fisheries, a grant of £4,000.

The particular purposes to be subserved by this grant are set out in the further extract from the Report already quoted :—

" The grant has been devoted partly to the employment of an Economic Botanist at Kew, who will be available either to visit the Dominions and Colonies from time to time or to set free a superior officer of the Kew staff to undertake oversea missions. It will also be used in part for sending botanical collectors to various parts of the world to study and bring home plants of economic importance for cultivation at Kew, and distribution to the Dominions and Colonies.

" The close liaison which exists between Kew and the agricultural and botanical departments of the world has proved of inestimable benefit to the Dominions and Colonies in the introduction of new staples and the development of the natural vegetable resources of the Empire. With the progressive opening up of new territories and the continual expansion of agricultural enterprise in the Dominions and Colonies the need has arisen for a closer co-operation and a more direct service, and these the grant from the Empire Marketing Fund is designed to afford."

Official Visits.—Arising out of the grant from the Empire Marketing Board the following official visits were undertaken during the year.

On the invitation of the Commonwealth Council for Scientific and Industrial Research, Melbourne, the Director left England in November to visit Australia. The object of his visit is to study the various botanical and allied institutions in the different States, on behalf of the Commonwealth Council. It is intended that he will attend the Australian Association for the Advancement of Science at their meeting in Hobart in January, and then, on the invitation of the Dominion Government he will visit New Zealand. His return journey will be through Java, Malay, and Ceylon to enable him to visit the botanical centres of those countries.

Mr. H. C. Sampson, the Economic Botanist newly appointed to the Kew Staff, left England on June 11th on a mission to British Guiana for the purpose of studying the local conditions in that country and of suggesting steps necessary for improving the agricultural prospects of that Colony. He availed himself of the opportunity of this tour to visit Trinidad, Barbados and the Leeward and Windward Islands, with a view to acquainting himself with the agricultural developments which have taken place there. He returned to this country on October 3rd, and the reports on his tour have been submitted to the Secretary of State for the Colonies.

Mr. W. Dallimore, Keeper of the Museums, visited Majorca early in September to procure grafts of several of the best varieties of Almonds. Owing to the large and growing demand for Almonds for culinary and dessert purposes it has for some time been felt that the cultivation of Almonds in certain parts of the Empire might advantageously be increased. In order to raise a stock of the best kinds for distribution, it was decided to procure grafts of the premier varieties grown in Majorca, an island famous for its Almonds.

The grafts obtained were brought to England, where they were immediately worked upon specially prepared stocks. From these grafts it is hoped that upwards of a hundred plants will be available in 1928 for despatch to suitable destinations.

Mr. F. N. Howes, Assistant, Museums, left in December on a visit to the East to study and collect Bananas to be sent to Kew in the first instance, and ultimately to Trinidad, for the purpose of raising strains of Bananas immune to Panama disease. Mr. Howes will first visit the Malay Peninsula and later Java, Siam, Burma, Madras and Ceylon.

Mr. W. Taylor, Assistant Curator, Tropical Department, also left in December on a visit to the East to bring back collections of useful and interesting plants for distribution and to enrich the collections at Kew, and also to study tropical plants in their native homes and under local conditions. Mr. Taylor will visit the Botanic Gardens at Penang, Singapore, Buitenzorg, and Peradeniya.

Apart from those visits already mentioned as having been arranged in connection with the grant from the Empire Marketing Board, the following visits were undertaken by members of the staff during the year.

The Keeper of the Herbarium visited the herbaria of Berlin and Vienna in order to study organisation and confer with the heads of these departments with regard to the work of specialists engaged in monographic and floristic research. He also visited the Pflanzenphysiologisches Institut and the Biologisches Reichanstalt fur Land und Forstwirtschaft at Berlin in connection with mycology and plant pathology. At Vienna, he spent some days at the National Herbarium in the Naturhistorisches Museum, and at the Botanic Institute of the University, which also possesses a large and valuable herbarium. In the Naturhistorisches Museum he was successful in tracing the Sonder herbarium. Sonder's plants were found in the Reichenbach herbarium, which was formerly kept apart but is now incorporated in the general collection. The whereabouts of this herbarium, exceedingly valuable on account of the many old types quoted in Flora Capensis, has long been a mystery at Kew. After Vienna the Keeper spent ten days in Czechoslovakia, seeing something of the principal botanical and agricultural institutions in Bohemia and Moravia. He also took the opportunity when passing through Germany of visiting the Botanic Gardens at Dresden, Darmstadt and Frankfurt.

In connection with the work on the Flora of West Tropical Africa Mr. J. Hutchinson paid two visits to Paris of about ten days' duration each, to examine Dr. Chevalier's collections in the Muséum d'Histoire Naturelle. He also visited the University of Lyons with the object of examining African material.

In connection with her monograph of *Crotalaria* Miss I. C. Verdoorn, the Assistant for South Africa, spent some days at Brussels examining the herbarium specimens of this genus.

The Keeper of the Museums attended the Annual Meeting of the Museums Association held in the Isle of Man early in July.

The Curator visited the Scilly Isles in April, chiefly to study the wonderful collection of trees and shrubs grown in the open air at Tresco Abbey by Major Dorrien Smith. Many of the species are natives of Australia, Tasmania, New Zealand and the smaller Australasian islands; others come from South Africa and the Canary Isles. Tresco is the only place in the British Isles where so many of these Australasian species can be seen growing out-of-doors.

The annual exhibition held at Truro, chiefly of the products of Cornish gardens, was visited on the return journey.

Mr. J. Coutts, Assistant Curator, served on the Grand Jury at the International Horticultural Exhibition held at Brussels during August. He took advantage of being in Belgium to visit the Botanic Gardens, Brussels, as well as several of the well-known commercial horticultural establishments at Ghent and Bruges.

Advisory Work.—During the year the Director was appointed a representative of the Ministry of Agriculture and Fisheries on the Council of the John Innes Horticultural Institution, Merton, Surrey. He was also appointed a delegate to represent the Ministry of Agriculture and Fisheries at the Imperial Agricultural Research Conference, 1927.

Mr. H. C. Sampson was appointed a member of an Empire Marketing Board Advisory Committee on Infestation of Stored Products. He also represents the Director, during the latter's absence overseas, on the Colonial Agricultural Research Organisation Committee, the Colonial Fruit Grants Committee of the Empire Marketing Board, and Imperial Institute Advisory Committees.

The Keeper of the Herbarium visited Worthing at the request of the Fisheries Department of the Ministry, to investigate the reported accumulation of seaweed on the foreshore.

Publications.—Ten numbers of the *Kew Bulletin* were published, and three Appendices. Appendix I was the Review of the Work of Kew for 1926. Appendix II, List of Staffs, was issued in a new style and considerably more information was incorporated. Appendix III contained the List of Seeds available for exchange.

The pamphlet entitled "Hints for Collectors," which had been reprinted from the Article appearing in *Kew Bulletin*, 1914, pp. 97-116, was revised and issued as a separate publication.

The Bentham Trustees issued Part I of volume ii of the Fifth Series of Hooker's Icones Plantarum, which had been prepared by the staff at Kew.

A new edition of the Illustrated Guide was published, and a new edition of the Popular Official Guide has been prepared and will be on sale shortly. This latter Guide has been extensively revised, and contains new features, such as an enlarged index and page headings, by which its usefulness will be increased. A number of new postcards have been placed on sale. These include pictures in natural colours of the Iris Garden, *Cornus Nuttallii*, *Prunus Lannesiana*, *Dendrobium thyrsiflorum*, *Angraecum sesquipedale* and Grape Hyacinths. There is also a set of six cards in colour representing some of the ornamental ducks which are to be found on the Pond by Museum I, and a set of seven black-and-white cards of geese, swans, etc., including a picture of " Joey," the Stanley Crane.

Other publications are mentioned on p. 19, and pp. 22-33.

Parks Regulation Acts, 1872 and 1926.—The Regulations prescribed in the First Schedule to the Parks Regulation Act, 1872 (35 & 36 Vict. c. 15), having been repealed by the Parks Regulation (Amendment) Act, 1926 (16 & 17 Geo. 5, c. 33), as from 15th December, 1927, the ' Rules for Kew Gardens and Pleasure Grounds ' in connection therewith ceased to have effect as from the date mentioned. They have been replaced by ' The Royal Botanic Gardens, Kew, Regulations, 1927, dated the fifteenth day of December, 1927, made by the Minister of Agriculture and Fisheries under the powers vested in him by the Parks Regulation Acts, 1872 and 1926.'

Imperial Agricultural Research Conference.—The Delegates to the Imperial Agricultural Research Conference visited Kew on 31st October. In the morning they visited the Herbarium and Library where the work of the Department was explained by the Keeper, Mr. Cotton, and special exhibits of interest were inspected. After lunch, under guidance of members of the staff, they toured the Gardens and Museums and saw the work of these departments in relation to the Empire generally.

Board of Education.—By arrangement with the Board of Education, a short course of instruction for Teachers in Secondary Schools was again held at Kew. The course, which was organised by Dr. Harold Wager, F.R.S., was attended by 41 teachers and lasted from July 29th to August 11th ; it included lectures and practical botanical work, for which accommodation was provided in the Lecture Rooms adjoining the Jodrell Laboratory, demonstrations in the Gardens and Museums, and visits to the Herbarium and Library. The Director and several members of the Staff were invited to lecture to the class on special subjects. The last course of a similar nature was held in 1925.

British Ecological Society.—On the 11th June the British Ecological Society visited Kew and were shown the special work

undertaken in the Experimental Ground. In the Herbarium a series of exhibits was arranged. Specimens illustrating the Sclerophyllous Brushwood Communities from various parts of the world were specially shown. The Gardens were also visited under guidance of members of the staff and various plant types and subjects of ecological interest were demonstrated.

Courses of Instruction.—During 1927, as in previous years, special courses were arranged, at the request of the Secretary of State for the Colonies, for Probationers and Officers of Scientific Departments in the Colonies. The subjects included taxonomy, ecology, genetics, mycology, economic botany and general horticulture.

National Pinetum at Bedgebury.—Many of the young trees began to grow very early in the spring. By the middle of April some had formed new shoots 1–2 in. long. Then two very cold nights occurred when 8° and 11° (Fahrenheit) of frost were registered. All the young shoots were killed, and, as the frosts were followed by several weeks of dry weather with cold winds, the plants were slow in recovering. The wet summer was favourable for the plants on the whole but many of those most seriously injured by frost remained stationary throughout the summer. Pine weevils were again troublesome and certain pines were injured. Some 10,000 pine weevils were trapped. *Aphis abietina* again appeared on some of the Spruces, and *Chermes* sp. on *Abies* spp., but constant spraying with insecticides kept these pests in check. Numerous old Rhododendrons were cleared out, and trees felled to make room for the remainder of the *Taxaceae* and *Cupressus* which it is hoped will be planted next March. The heavy snowstorm of December 25–26 did not seriously injure the trees at Bedgebury.

Although there have been many difficulties to contend with, the majority of the young plants are growing well, particularly Larches, Junipers, Cedars, Douglas Firs, N. American Firs, Cypresses, Thuyas and Hemlocks. Spruces that were unaffected by Aphis, and that were not injured by frost, are growing well, but those injured are not in a very satisfactory condition. Many of the Asiatic Firs suffered badly from frost and numerous Pines were damaged through weevil attacks. Given a favourable growing time next spring some of the badly injured trees will probably recover, but there are others that must be replaced. The abnormally wet summer and autumn added very considerably to the labour and expense of keeping the young trees clear of coarse weeds.

The Gardens.

Visitors.—The number of visitors to the Gardens in 1927 was 1,078,088. This was a decrease of 84,459 on the figures for the preceding year. This decrease took place in the first five months of the year, and for the remaining months the numbers were generally

higher, especially in December when an increase of nearly 5,000 was recorded. The month of May with 227,063 was the greatest monthly record in the year, December with 9,937 was the lowest. The largest daily attendance was 60,104 on Easter Monday, April 18th, and the smallest 6 on November 29th. On Students' Days (Tuesdays and Fridays), when an admission fee of 6d. is charged, the attendance went up from 62,285 to 74,417. The absence of bright sunny weather, the greater rainfall and its general distribution through the year, and a particularly sunless and foggy autumn tended adversely to affect the attendance of visitors.

PLANT HOUSES.—A new span-roofed house for the cultivation of bananas was erected in the private yard near the Curator's Office. The object of this house is to provide isolated accommodation for the cultivation of this very important class of plants, so that new varieties obtained by Kew for transmission to the banana-growing colonies may be put in quarantine until they can be certified free from insect or fungus disease. At the same time it will afford means of propagating desirable varieties. The interior dimensions of the house are :—Height 16 feet, length 34 feet, width 20 feet. A depth of two feet of rich loam has been provided for the plants. Such a house, of course, is not big enough to allow the larger-growing banana plants space for full development—but it will, it is hoped, serve the purpose desired. The cost of its erection was met by a grant from the Empire Marketing Board.

The overhauling of the roof of the Temperate House referred to in last year's Review (p. 4), which consists chiefly in re-bedding the panes of glass with fresh putty, was continued during the summer and autumn. The trouble and annoyance caused by drip during rainy weather has been greatly reduced in consequence.

The interior of the *Victoria regia* House (No. 10) was repainted, and considerable repairs were done to the woodwork, much of which had decayed. It is intended during 1928 to provide increased accommodation for the collection of insectivorous plants, a group in which the general public is keenly interested. For this purpose the Annex attached to the *Victoria regia* House in which they have hitherto been grown has been pulled down and the gabled portion of the main building brought down to the common slope of the roof. The new Annex for insectivorous plants, which will be considerably larger than the old one, is being built on the same site.

FLOWER GARDEN.—During the War the parterre between the Palm House and the Pond was dug up and given over to the cultivation of vegetables for a few years. When restored to its position as the chief site in Kew for spring and summer bedding, a design of flower beds different from that previously existing was adopted. As the original design is considered preferable in affording opportunities for the display of a more varied set of plants, it was restored last autumn in time for the reception of bulbs and other spring-flowering plants.

SERVICE ROAD.—In last year's Review (p. 6) it was noted that the section of this road which extends from the Kew Palace Depôt to the Stable Yard had, during 1926, been re-made. The remaining portions, one reaching from the Stable Yard to the Oxenhouse Gate which opens on to the Old Deer Park, the other connecting the Stable Yard with the Queen's Cottage Grounds, have been similarly treated.

HERBACEOUS GROUND.—The systematic overhauling of the Natural Family Beds in the Herbaceous Department has been in progress, and the section west of the gravel walk that bisects this area has been completed. The beds have been trenched two feet deep, and the poorer soil replaced with new loam, about 250 loads of which have so far been used. Bone meal has also been incorporated as the work proceeded.

CHINESE RHODODENDRONS.—A further plantation of these shrubs has been made in the wood between the Cedar Vista and the collection of cypresses and yews. Mr. J. C. Williams, in his wonderful collection at Caerhays, was the first to show that the ideal place for rhododendrons was on sites where the overhead growth of large trees afforded them a certain amount of shade. His lead is now being generally followed. One important thing, however, is that the trees with which they are associated shall be of the right kind. Experience seems to prove that of our native trees the oak is the best, perhaps the only one that associates happily with rhododendrons, chiefly because its roots are comparatively few and go deep into the soil. Unfortunately the dominant tree at Kew is the beech, than which no worse a tree could be found to associate with rhododendrons. Its roots are far-spreading and keep so close to the surface that moisture-loving plants like rhododendrons stand no chance in competition with them. The site above-mentioned happens to be one where a group of oaks only was planted, so it is probably as suitable a place for rhododendrons as can be found in Kew.

It is, however, becoming only too apparent that the great bulk of the new Chinese rhododendrons are not going to add much to the beauty of gardens with a situation and climate like that of Kew. This applies more to the larger, broader-leaved ones than to the smaller scaly-leaved ones. Late-starting and late-flowering species such as *R. discolor* succeed very well indeed, but unfortunately the great majority are early-flowering and early-growing and consequently at the mercy of every late frost. The condition of the Chinese rhododendrons at Kew after the frosts of last April made one glad that there were old-fashioned garden hybrids to fall back on, in spite of the fact that there is an inclination nowadays to belittle them. It is fairly evident by now that except in specially favoured places the really successful cultivation of the majority of the large-leaved rhododendrons will have to be confined to western and southern maritime counties.

Tree and Shrub Collections.—In the Review for 1926 (p. 5) the re-arrangement of the collections of shrubby *Rosaceae* and *Saxifragaceae* was alluded to. Owing considerably, no doubt, to the cool wet summer the transplanted shrubs succeeded remarkably well, and scarcely a plant was lost even amongst the old rose plants which had been undisturbed for at least three decades.

During the past autumn and early winter the collections in the Berberis Dell and surrounding area have been overhauled. The early families (in the Bentham and Hooker conception) are planted here, and besides the *Berberidaceae* there are also the *Magnoliaceae. Ranunculaceae, Tiliaceae, Cistaceae, Malvaceae, Rutaceae, Hypericaceae* and smaller allied families. The work involved is of a somewhat routine nature, consisting chiefly of spacing out plants that have become crowded, the removal of duplicates, and the addition of new species and varieties from the nurseries. Advantage is also taken of the opportunity to supply the plants with manure and new soil of a richer nature than that of Kew. The twentieth century exploration of China has nearly doubled the number of species of barbery in cultivation, and the problem of finding room for them becomes yearly more pressing.

Items of Special Interest.—Special exhibitions were again arranged throughout the year in House 14 c. They included an exhibit of Citrus fruits from the gardens of Mr. Cecil Hanbury at La Mortola; examples of Phyllodes and Cladodes; a selection of economic plants, and a Wardian Case; examples of parallel development shown by plants belonging to widely different Natural Families; Pelargoniums and the derived modern garden "Geraniums"; Sensitive Plants; Cacti from the deserts of Southern Arizona; *Begonia* species and the derived winter-flowering and tuberous-rooted Begonias; *Cyclamen indicum* and its modern derivatives; *Petunia* species and recent horticultural forms; *Calceolaria* species, hybrids and varieties; new and rare plants.

Agaves in Flower.—The following species of *Agave* flowered during the past year:—*A. Ellemeetiana* (2 plants), *A. filifera, A. Hookeri, A. Kerchovei, A. rigida* var. and *A. potatorum.* The blossoming of Agaves in our collection is naturally of great interest to botanists, and the tall, handsome spikes add greatly to the interest of the Succulent House (No. 5) during the long period they continue to develop flowers. But it is not altogether a matter for congratulation. All the plants mentioned above were exceptionally fine examples of their respective species and their flowering and consequent death has involved a noticeable loss to the collection.

Pita Fibre Plant.—The production of flowers, for the first time under cultivation in this country, by the Pita Fibre plant, *Bromelia Magdalenae,* should not pass unnoticed. Several consignments of leaves of this plant, which is thriving well in the Palm House, have been sent to people interested in fibre production.

Amorphophallus Titanum.—A plant of the Giant Aroid flowered during September in the Water-lily House (No. 15). Although not quite so large as the one produced by the plant which flowered in 1926 (*see K.B.* 1926, p. 374), the spathe was a very fine one of good colour and perfect shape. Owing probably to the cool, dull weather, it remained in good condition several days longer than did the spathe of the one which flowered in the previous year. Notes about its flowering in the popular press resulted in its being inspected by a great number of visitors.

Virgilia capensis.—Introduced from the Cape of Good Hope in 1767 and figured in the Botanical Magazine as long ago as 1813, this beautiful small tree has been almost lost sight of for a long time. For several weeks in the late summer a plant, some seven or eight feet high, growing in the Temperate House, continued to produce its racemes of pink, pea-shaped flowers which associate charmingly with beautiful silvery, linear-lanceolate, pubescent leaflets, each 1 to 1½ inches long.

East Indian Rhododendrons.—A number of rhododendrons of the Javan, or East Indian, section were kindly presented by the executors of the late Sir George Holford from the fine collection at Westonbirt. The collection at Kew has, during recent years, been grown in the Mexican House, but this structure is apparently somewhat too warm for them. A trial is being made with some of the Westonbirt plants in the borders of the Conservatory (No. 4) where the conditions are cooler.

Californian Cacti.—A valuable and very interesting collection of cactuses from California, mostly new to our collection, was presented by Mr. W. T. Swingle, U.S. Date Garden, Indio, California, amongst them a plant of *Echinocactus acanthodes* weighing 2 cwt. This has been planted in the Succulent House. We have to acknowledge the courtesy of the Royal Mail Steam Packet Co., Ltd., in bringing the plants from Los Angeles to London on one of their ships free of charge.

Reference was made in *K. B.* Appendix I, 1927, p. 8, to the despatch of a number of trees to the Sydney Botanic Garden, to be planted at Canberra by the Duke and Duchess of York and other notable personages on the occasion of the opening of the new Parliament Buildings. The Curator of the Botanic Gardens, Sydney, reported that they arrived in excellent condition as fresh as if they had been sent from a local nursery only a few miles away. The roots and wood of the trees were sound and the buds plump and firm. The actual ceremony of planting the trees at Canberra by the Duke and Duchess of York took place on the morning of May 10th. On the same day the Governor-General of the Commonwealth and the Prime Minister planted some of the trees at the Royal Military College, Canberra.

Snowstorm.—During the night of December 25th and the morning of the 26th there occurred the heaviest fall of snow that has taken place at Kew for many years. Although only about four inches fell, it was of so wet and adhesive a nature that it clung to the branches of the trees and shrubs, both deciduous and evergreen, in an extraordinary way. Even on quite thin, leafless branches the snow piled into narrow lath-like ridges one inch or more high. On evergreens it lay as a solid carpet three inches thick. The consequent breaking down of branches, varying in size from limbs over a foot in diameter to comparatively small twigs, was such as has not been witnessed at Kew for more than forty years. The damage done to evergreens, especially to conifers of the cypress group, evergreen oaks, and arbutuses, is deplorable. Nor have deciduous things escaped, the broom tribe particularly having suffered much injury. Even when not broken, many trees and shrubs were borne to the ground by the weight of snow and partially uprooted. Besides clearing away the wreckage, a great amount of work has been entailed in trimming up wounds and antiseptically treating them with gas tar. The fine old Stone pine (*Pinus Pinea*) near the Director's Office, which has been so well known and striking a feature of Kew for many years, had a large branch snapped off which has rather impaired its symmetry, but perhaps with such a heavy-topped, densely foliaged tree it is a matter for congratulation that no worse damage has occurred to it. Considering how susceptible to breakage by snow large cedars of Lebanon are, it is fortunate that ours escaped much injury. As a matter of fact small specimens suffered much more. The fine group of *Ceanothus thyrsiflorus* near the Broad Walk, which has made so charming a display of its pale blue flowers in June for many years past, has been much broken about. One of the most lamentable results of the snowfall was the breakage suffered by numerous Holm Oaks (*Quercus Ilex*). These trees undoubtedly provide the noblest evergreen effects in the winter landscape at Kew, and we of the present day have much reason to bear in grateful remembrance the foresight of men of earlier times who recognised their merits and planted them so freely. One tree near the Service road was found on the morning of December 26th absolutely bereft of every limb, leaving merely a naked stump a few feet high. One of the fine trees near the Ruined Arch lost a large limb as did also another near the Pond. As regards smaller trees it was very noticeable how those of erect habit were injured much more severely than those with a more spreading graceful shape. The bulk of the rhododendrons escaped although a few old plants were ruined; hollies and yews were almost entirely uninjured.

Contributions to Gardens, 1927.—Amongst the donors of plants and seeds to Kew during 1927 special mention has to be made of Mr. Lionel de Rothschild, who presented altogether 283 packets of seeds, which included a set of those collected by Mr. Comber during his travels in Chile and others collected by Capt. Kingdon Ward.

Mr. de Rothschild also supplied some plants of rare species of Rhododendron. To Mr. J. C. Williams, of Caerhays Castle, acknowledgment has to be expressed for the continuation of his generosity to Kew which has lasted over so many years.

We have received through the agency of Mr. T. Hay, the Superintendent of Hyde Park, seeds of many very interesting species of plants. The new *Fremontia mexicana* raised from his seeds flowered during several weeks of the late summer.

Advantage was taken of the dispersal of the collection of crocuses, made by the late Mr. Dykes, to purchase a complete set of corms.

The number of separate consignments of living plants, seeds, etc., was 850, an increase of 61 on that for 1926. The most important contributions apart from those mentioned above were the following :—

Public Institutions :—

Home.

Cambridge, Botanic Garden.—Plants, cuttings, bulbs and seeds.
Chelsea, Physic Garden.—Plants of *Nepenthes albomarginata* and *Lycopodium phyllanthoides.*
Edinburgh, Royal Botanic Garden.—Plants and seeds (157 packets).
Glasnevin, Dublin, Botanic Garden.—Plants.
John Innes Horticultural Institution, Merton.—Seeds, plants and cuttings.
London County Council (Parks Department).—Collection of trees and shrubs, etc.
Wisley, Royal Horticultural Society's Gardens.—Seeds and plants.

Abroad.

Arnold Arboretum, Jamaica Plain, Mass., U.S.A.—Seeds, plants and grafts of trees and shrubs, including species collected by J. F. Rock in China.
Brisbane, Queensland, Australia, Botanic Garden.—Plants (Australian).
British Columbia, University of (per Prof. J. Davidson).—Seeds.
Brooklyn Botanic Garden, New York, U.S.A.—Tubers : *Nelumbium speciosum.*
California, U.S.A., Golden Gate Park.—Plants : species of *Ceanothus, Escallonia.*
Dahlem, Botanic Garden.—Seeds : 59 packets.
Dehra Dun, U.P., India, Forest Research Institute and College.—Seeds.
Dunedin, New Zealand, Botanic Garden.—Seeds.
Jamaica, Department of Science and Agriculture.—Filmy ferns.
Kirstenbosch, South Africa, Botanic Gardens.—Seeds : *Watsonia, Erica, Protea* spp., etc.
Leningrad, U.S.S.R., Botanic Garden.—Seeds : 60 packets.
Lyons, France, Botanic Garden.—Seeds : 57 packets.

Madagascar, Station Agricole.—Plants (including *Didiera mirabilis*) and seeds.
Moscow, U.S.S.R., Botanic Gardens.—Seeds.
Moscow, U.S.S.R., Institute of Applied Botany.—Seeds: 42 packets of Decorative Mongolian Poppies.
Missouri Botanic Garden, St. Louis, Mo., U.S.A.—Plants of *Peristeria elata*.
Ottawa, Canada, Department of Agriculture (Central Experimental Farm).—Seeds.
Peradeniya, Ceylon, Royal Botanic Garden.—Collection of plants.
Sarajevo, Jugo-Slavia, Botanic Garden.—Seeds: 51 packets.
Seychelles, Department of Agriculture.—Fruits of "Coco-de-Mer" (*Lodoicea sechellarum*).
Tashkent, Turkestan, University Botanic Garden.—Seeds: 50 packets.
Tiflis, Georgia, Botanic Garden.—Seeds: 49 packets.
Trinidad, Royal Botanic Gardens.—Stove plants.
Washington, United States Department of Agriculture.—Plants.

Private Donors:—

H.M. King Boris of Bulgaria.—Bulbs of *Lilium Jankae*.
Mr. B. C. Aston, Wellington, New Zealand.—24 packets of seeds of New Zealand plants including *Dactylanthus Taylori*.
Mr. S. C. Atchley, British Legation, Athens.—Seeds and bulbs.
Mr. Lloyd Austin, Eddy Tree Breeding Station, Inc., Placerville, California, U.S.A.—Seeds.
Mr. F. R. S. Balfour, Dawyck, Stobo, Peeblesshire.—Seeds.
Colonel F. Bird, Melbourne, Victoria, Australia.—Seeds.
Mr. S. F. Blake, Washington, U.S.A.—149 packets of seeds.
Rev. A. T. Boscawen, Long Rock, Cornwall.—Seedlings of *Telopea speciosissima*, etc.
Mr. N. E. Brown, Kew.—Plants and seeds including *Huernia* and *Odontophorus* spp., etc.
Mr. W. S. Chamberlain, Twickenham.—Seeds, including *Ranunculus Lyallii*.
Messrs. Dobbie & Co., Ltd., Edinburgh.—Plants of 12 named varieties of collarette Dahlias.
Major A. A. Dorrien Smith, Tresco Abbey, Isles of Scilly.—Plants and seeds.
Mrs. Earnshaw, Cranley Gardens, London, S.W.—A collection of orchids.
Senor Don Agustin Edwards, Chile.—Seeds of *Nothofagus obliqua*.
Major R. Emmet, Moreton Paddox, Warwickshire.—Seeds and plants.
Hon. Vicary Gibbs, Aldenham.—Trees, shrubs and herbaceous plants.

Mr. Cecil Hanbury, La Mortola, Ventimiglia, Italy.—Plants, bulbs and seeds.

Miss Agnes Hill, Groendoorn, S.W. Africa.—Plants, bulbs, tubers and seeds.

Mr. G. Lindley Hinde, Kamrup, Assam.—Collections of orchids.

The Executors of the late Sir George Holford, Westonbirt.—A collection of Clivias and Javanese rhododendrons.

Mr. Louis Van Houtte, père, La Pinte-lez-Gand, Belgium.—Stove and greenhouse plants.

Captain C. Ingram, Benenden, Kent.—Plants and seeds, including 41 packets of seeds collected in South Africa.

Hon. Robert James, St. Nicholas, Richmond, Yorks.—Plants and cuttings.

Mr. G. H. Johnstone, Trewithen, Cornwall.—Plant of *Rhododendron eriogynum* and of a blue-flowered *Fabiana*.

Dr. A. F. G. Kerr, Siam.—Seeds, including *Gossypium arboreum*.

Mr. C. H. Lankester, Cartago, Costa Rica.—Plants, including species of *Coryanthes*, *Clusia* and *Cryptophoranthus*.

Mr. A. E. Lawrance, Lago Petroleum Corporation, Venezuela.—Seeds, bulbs and plants, including orchids collected in Venezuela.

The late Professor Anstruther Lawson, University of Sydney, Australia.—A collection of ground orchids.

Dr. F. Lemperg, Hatzendorf, Steiermark, Austria.—Plants, corms and 51 packets of seeds.

His Excellency Sir John Loader Maffey, Governor General of the Sudan.—Plants, bulbs, roots and tubers, collected in the South Sudan, Imatong Hills, etc.

H.H. The Prince of Monaco, Monte Carlo.—Plants and cuttings of succulents, including *Echinocactus Grusonii*.

Lt.-Colonel L. Messel, Nymans, Handcross.—Plants and bulbs.

Mr. C. T. Musgrave, Hascombe Place, Godalming.—Plants and seeds.

Dr. H. Perrier de la Bathie, Madagascar.—Plants: *Kalanchoe* spp.

Mr. Amos Perry, Enfield, Middlesex.—Seeds, plants and bulbs, including *Brunsvigia Josephinae*.

Sir John Ramsden, Bt., Bulstrode.—Plants introduced by Captain Kingdon Ward, amongst others.

Mr. G. Reuthe, Fox Hill Plant Nurseries, Keston, Kent.—Collection of plants.

Dr. F. W. Stansfield, Reading.—A collection of hardy ferns.

Mr. H. Steedman, Victoria Park, Western Australia.—169 packets of seeds.

Major F. Stern, Highdown, Goring by Sea.—Plants and cuttings.

Mr. T. P. Stokoe, Cape Town, South Africa.—Seeds of *Erica* spp.

Messrs. Sutton & Sons, Reading.—Seedling primulas in variety.

Lt.-Colonel E. E. Todd, 14, Dryden Chambers, W.1.—Plants and seeds of *Viola* spp.

Mr. J. C. Watt, Aberdeen.—Seeds of Himalayan rhododendrons.

Mr. F. A. Weinthal, Sydney, New South Wales.—Orchids.

Mr. W. I. Whitaker, Pylewell Park.—Plant of *Crotalaria agatiflora*.

Mr. P. D. Williams, Cornwall.—Plants.

Miss M. Wilman, McGregor Museum, Kimberley, South Africa.—Plants: Cape succulents.

Mr. K. Yashiroda, Kagawaken, Japan.—Seeds.

Distribution of Plants and Seeds. There were 192 recipients of seeds sent out from Kew, the total number of packets distributed being 12,966—hardy trees and shrubs, 4,521, herbaceous plants, 8,445; an increase of 2,908 packets compared with the 1926 distribution.

The most important seeds specially distributed were:—*Heteromeles arbutifolia*, *Melia Azedarach* var. *umbraculiformis*, *Ranunculus Lyallii*, *Cinnamomum Camphora*, *Arachis hypogaea* (Basse variety), *Rhopalostylis sapida*, *Corynocarpus laevigatus*, *Caesalpinia brevifolia* (Algarobilla).

Wardian cases of plants were despatched to the Botanic Gardens, Buitenzorg (Java), Cameroons, Peradeniya and Singapore, also to H.E. the Governor, Nigeria; the Division of Botany, Pretoria; the Department of Agriculture, Dar es Salaam, Tanganyika; and the Department of Agriculture, Port of Spain, Trinidad. Other overseas consignments of a fairly bulky nature were sent to Accra, Gold Coast (Achimota College); the Commissioner of Lands and Forests, Freetown, Sierra Leone; the Department of Science and Agriculture, Kingston, Jamaica; the Government Gardens, Nilgiris, Madras; and the Imperial College of Tropical Agriculture and the Department of Agriculture, Trinidad.

Other recipients of plants, etc., from Kew, included the following:—

Arnold Arboretum, Mass., U.S.A.—Seeds and cuttings of trees and shrubs.

Beirut, American University.—Plants of *Elodea canadensis*.

Bermuda, Department of Agriculture.—Bulbs of *Eucharis grandiflora*.

Mr. F. W. Black, for Tristan da Cunha.—Seeds of trees and shrubs.

Rev. A. T. Boscawen, Long Rock, Cornwall.—Tender plants.

Bristol University.—Plant: *Hevea brasiliensis*.

Burroughs, Wellcome & Co., London.—Roots of *Ephedra* species.

Canada, Department of Agriculture.—Plants and cuttings of poplars, etc.

Cambridge Botanic Garden.—Greenhouse and stove plants.

Cambridge, Corpus Christi College.—Plant: *Halesia carolina*.

Chelsea Physic Garden, London.—Greenhouse plants.

H.E. the Colombian Minister, London.—Plants of *Hydnocarpus Wightiana* and *H. anthelmintica*.

Cracow, Poland, University Botanic Garden.—Cuttings of *Prunus*, *Pyrus*, *Quercus* and other hardy trees.

Demerara, Department of Science and Agriculture.—Roots of Cannas.

Edinburgh, Royal Botanic Garden.—Greenhouse and stove plants.

Egypt, Department of Agriculture.—Seeds and fern spores.

Falkland Islands, H.E. the Governor, Port Stanley.—Plants and seeds.

Mr. G. B. Foote, Puwakpitiya, Ceylon.—Orchids.

Forestry Commission, Whitehall, S.W.—Hardy conifers.

Mr. R. C. Bruce Gardner, Conington Hall, near Cambridge.—Plants : *Quercus* spp., etc.

Hon. Vicary Gibbs, Aldenham.—Collection of plants.

Glasnevin, Dublin, Botanic Garden.—Plants and cuttings.

Mr. C. Hanbury, La Mortola, Ventimiglia, Italy.—Plants, bulbs and seeds.

Messrs. Hillier & Sons, Winchester.—Trees and shrubs.

Mr. G. Lindley Hinde, Kamrup, Assam.—Orchids.

Sir Henry Hoare, Bt., Stourhead, Wiltshire.—Cuttings of poplar spp.

Hyde Park.—Plants and seeds.

Captain C. Ingram, Benenden, Kent.—Trees and shrubs.

Jamaica, Department of Science and Agriculture.—*Hippeastrum.* bulbs.

John Innes Horticultural Institution, Merton.—Plants, seeds and cuttings.

London County Council (Parks Department).—Collection of trees and shrubs.

Manchester Corporation (Parks Department).—Plants of *Melocactus Broadwayi.*

Hon. H. D. McLaren, Bodnant, North Wales.—Plants of *Rhododendron*, *Meconopsis*, etc.

Lt.-Colonel L. Messel, Nymans, Handcross. —*Rhododendron* seedlings, etc.

H.H. The Prince of Monaco.—Collection of succulents.

Mr. C. T. Musgrave, Hascombe Place, Godalming.—Plants and seeds.

Oxford, Botanic Garden.—Plants of *Melocactus Broadwayi.*

Oxford, Imperial Forestry Institute.—Collection of plants for exhibition purposes, also seeds.

Rev. Robert Pooley, for Tristan da Cunha.—Cuttings of willows and poplars.

Mr. Charles O. L. Power, Madeira.—Collection of plants.

Mr. L. de Rothschild, Exbury House.—Tubers of *Nymphaea* spp.

Major F. Stern, Highdown, Goring-by-Sea.—Plants and seeds.

Sierra Leone, Freetown, Commissioner of Lands and Forests.—plants.

Swansea, Parks Department.—Collection of economic plants.

H.H. The Raja of Tehri-Garhwal State.—Seeds of *Victoria regia*.
Trinidad, Department of Agriculture.—Seeds, *Hippeastrum* bulbs and banana stools.
Sir Oscar Warburg, Boidier, Headley, Epsom, Surrey.—Plants of *Magnolia* and *Quercus* spp.
Mr. F. A. Weinthal, Sydney, New South Wales.—Orchids.
Mr. P. D. Williams, Cornwall.—Shrubs and seeds.
Zoological Society of London.—Collection of plants for reptile house.

The usual distribution of surplus trees, shrubs and herbaceous plants to educational and public institutions was made in February.

Rainfall Record.

Rainfall recorded at the Royal Botanic Gardens, Kew, during 1927.

	Inches.		Inches.
January	1·75	July	3·07
February	3·31	August	4·26
March	2·63	September	4·61
April	2·26	October	1·39
May	1·07	November	2·70
June	3·13	December	3·03

Total 33·21 inches.

The total for 1926 was 24·96 inches.

The Museums.

General.—The reorganisation of the Museums, which began in 1926, was continued in 1927. Owing to the buildings being so scattered the general scheme could not be carried as far as could have been wished from the point of view of convenience and economy of management. Moreover, the restrictions of space and the necessity for maintaining a large collection of specimens, some of which are of scientific rather than commercial interest, do not permit such effective displays of certain plant products to be made as their importance demands. Again, there are numerous specimens of historic value, and others complementary to the specimens in the Herbarium collection, which must be kept where they are easily available when required for study, although they may be of little interest to the general public.

A little space was gained by removing two large cases from the top floor of Museum I to the porch of the North Gallery, where they are now used for the display of Japanese and Burmese lacquer ware. In order to make room for a series of special exhibits of popular interest in Museum I, cases containing large-sized models of an Indian Indigo Factory and an Indian Lac Factory were removed from the ground floor to Museum III, where room had to be made by

the removal to Store of three stands of botanical drawings and photographs of plants.

Certain exhibits which had deteriorated or had become out of date were replaced by the courtesy of Messrs. John K. King & Sons, Ltd., of Coggeshall, Essex, who supplied a very good selection of seeds of fodder grasses and food grains, and Messrs. J. T. Healey & Co., Ltd., of the Borough Granaries, London, who sent a collection of pulses and grains with some of their milled commercial preparations.

A long-felt want has been supplied by the erection of an electrically driven circular saw in the Preparer's Shop.

During the absence of Mr. F. N. Howes (*see* p. 3), temporary assistance has been obtained for general work.

Numerous visits have been paid to Commercial Sale Rooms and City Offices by members of the staff in connection with questions relating to economic plant products.

Routine Work.—There has been a very material increase in correspondence during 1927. Enquiries of the usual miscellaneous character have had reference to agriculture, horticulture, silviculture, plant products generally, and the identification of specimens. This correspondence has emanated from all parts of the Empire as well as from numerous foreign countries.

About 150 visitors requiring special information called at the Museums during the year, and in addition members of the staff have, from time to time, accompanied visitors round the collections.

Re-labelling has occupied a good deal of time, and, in order to reduce constant renewal of labels, experiments are being carried out with varnished labels.

Special Work.—Investigations into various questions concerning camphor begun in 1926 have been continued, and an Assistant has devoted a portion of his time to work on timber anatomy.

A Subject Index, in card form, of economic products of plants, is in course of preparation, and a large number of photographs of economic plants, views of Botanic Gardens in various parts of the Empire, and types of vegetation are being assembled, mounted and made available for reference. An alphabetical list of common names of plants and their botanical equivalents is also being prepared.

During the year special exhibits have been made of Cinchona, Dyes, Tanning Substances, Straws and Fibres suitable for hats, sports requisites, Portraits of Botanists with specimens of plants named in their honour, and the Effect of Smoke on Leaves of Evergreens.

The Keeper has continued to act as Executive Officer for the new Pinetum at Bedgebury.

PUBLICATIONS.—A new Guide has been published to the Timber Collections in Museum III, and a new edition of the Guide to Museum II is in course of preparation.

The Keeper acted as Convener of a Committee of the Empire Forestry Association formed for the purpose of preparing a Tentative List of Trade Names for Empire Timbers. This list has been printed and circulated throughout the Empire for the criticism of Forest Officers and the trade. It is intended that it shall receive special consideration at the Empire Forestry Conference which is to meet this year in Australia.

Publications by members of the Museum staff include "Variability of the Camphor Tree in Formosa" (*K.B.*, 1927, p. 157); "Agriculture and Horticulture in Majorca" (*K.B.* 1927, p. 369); "Minor Forest Products," read before the Forestry Sub-section of the British Association at Leeds, and published in the Empire Forestry Journal, vol. 6, p. 228.

MAINTENANCE WORK.—H.M. Office of Works have provided facilities during the current year for heating water for cleaning purposes in each of the Museums. Water has also been laid on in Museum III. In the past all water had to be carried at great inconvenience from outside.

The whole of the skylights in Museums II and III have been reglazed. For a number of years these skylights have been a source of trouble during every heavy shower. Although a good deal of scaffolding was needed it was possible to keep the buildings open during the time the work was in progress. The sanitary arrangements in Museum IV have been brought up-to-date.

Following the rearrangement of the specimens in Museum II a beginning has been made in the very necessary repainting and repair of the interior of the cases. It is fifty years or more since these cases were painted and the paint has become dirty and discoloured, and a considerable shrinkage has occurred in the woodwork.

PRESENTATIONS TO MUSEUMS.—The following are the principal donations received during 1927 :—

Mr. R. E. Holttum, Botanic Gardens, Singapore.—Nineteen specimens of timbers.

Messrs. Burroughs, Wellcome & Co., London.—Forty-eight samples of Drugs and Essential Oils.

Messrs. John K. King & Sons, Ltd., Coggeshall, Essex.—Ears and seeds of varieties of Wheat, Oats and Barley, and seeds of numerous Fodder Grasses, Clovers, etc.

Mr. I. H. Burkill, Kew.—Roots of *Dioscorea hispida*, prepared for eating.

The California Box Company, Oakland, California.—Redwood slats, and box made entirely by machinery.

Prof. René Maire, Université d'Alger.—Specimens of *Ephedra altissima* and *E. fragilis*.

Mr. J. B. Cassels, H.M. Government Trade Commissioner, British Guiana.—Samples of the Cattle Foods, Copraline and Molascuit.

Dr. Kanehira, Director of Forests, Formosa.—Specimens of 54 Formosan Woods.

Mr. W. E. Broadway, Trinidad.—Specimens of Woods.

Mr. M. T. Dawe, O.B.E., Lands and Forests Department, Sierra Leone.—Roots of a Melastomad used by the Temnes as a substitute for sugar.

Mrs. Grieve, Chalfont St. Peter, Bucks.—Pamphlets on Herbs.

The Agricultural Branch, Education Department, Victoria, B.C. —Sets of Photographs of Trees and Forestry Subjects in British Columbia.

Messrs. J. T. Healey & Co., Ltd., London.—Collection of Pulses, Grains, and commercial preparations.

Director-General, Commercial Intelligence and Statistics Bureau, Calcutta.—Samples of Chaulmoogra Seeds, Chaulmoogra Oils, Ointments and Soaps. Also Oil and Seeds of *Hydnocarpus Wightiana*.

Messrs. Carter, Page & Co., Ltd., London.—Collection of *Banksia* fruits from Western Australia.

The Chief, Division of Botany, Pretoria.—Logs of Camphor Wood for Distillation.

The Curator, Auckland Institute and Museum, New Zealand.— Fossil nuts of *Cocos zealandica*.

Mr. A. J. Large, Barbados.—Fruit and seeds of *Swietenia Mahagoni*.

Director, Forest Research Institute, Dehra Dun.—Paper made from Bamboo.

The Curator, Botanic Gardens, Dominica.—Twenty-five specimens of Dominica Timbers.

The Secretary, Egypt Exploration Society.—Specimens of Plant Products found in Ancient Egyptian Tombs.

Mr. H. Clinton-Baker, Bayfordbury, Herts.—Plank of *Abies magnifica*.

The Gas Light and Coke Company, London.—Section of Trunk of *Ginkgo biloba* from a tree grown in Brentford.

Dr. A. Kerr, Bangkok.—Citrus Fruit, variety called " Som Mu."

Sir George Watt, C.I.E., Lockerbie.—Collection of specimens illustrating the Lac Industry.

Specimens have been distributed to the following individuals and institutions :—The Avon Electricity Meter Co., Ltd., Kilburn ; Mr. J. Gordon Dalgliesh, Hove ; Director, Horticultural Section, El Giza, Cairo, Egypt ; Mr. W. T. Summers, Grantham ; Squadron-Leader E. R. Hillman Gray, R.A.F.M.S., Uxbridge ; Public Museums, Liverpool ; Sir David Prain ; Prof. Pieraerts, Service Chimique et Onialogique, Belgium ; Mr. D. Bliss, Swansea ; Dr. Burtt Davy, Oxford ; Messrs. Rose Downs & Thompson,

Westminster ; Messrs. J. Bibby & Sons, Liverpool ; University of Stellenbosch, South Africa ; Mr. A. van Vollenhoven, Sumatra ; Central School, Richmond, Surrey ; Belmont Boys' School, Chiswick ; Technical Instructor, Hogarth Senior Boys' School, Chiswick ; Birmingham Central Technical College ; Mr. E. Moe, Universitetets botaniske Have, Oslo.

Jodrell Laboratory.

A large number of specimens of different kinds, chiefly samples of woods, barks, fibres, roots, etc., were examined microscopically, and identified, as far as possible, by means of their anatomical structure. A study of different stages of the ovule of an Aroid (*Typhonodorum Lindleyanum*), begun some years ago, was carried further by the examination of fresh material collected from the plant grown at Kew.

Mr. L. E. Campbell made a microscopic examination of the pollen of species of *Citrus* and of some other plants.

Miss K. E. Ritson was engaged in further work in continuation of her investigation into the morphology, anatomy and physiology of reproduction in the Ground-nut, *Arachis hypogaea* L.

Mr. W. C. Worsdell continued his comparative study of the anatomy of fasciated and of normal plants of *Campanula carpatica*, on behalf of the John Innes Horticultural Institution, Merton, where the plants were grown.

Cultures of various Fungi were made by members of the Herbarium Staff, either for purposes of identification, or, in the case of *Rhizoctonia* and *Vermicularia*, in connection with researches on species of these genera (*see* p. 30).

A considerable amount of pollen of Alder and Poplar was supplied from Kew for experimental purposes, the removal of bud-scales, anthers, etc., which are present in some quantity among the pollen as ordinarily collected, being carried out in the Jodrell Laboratory.

A microscopic examination of samples of West Indian Arrowroot was made in connection with a statement, forwarded to Kew, that the starch-grains of Bermuda Arrowroot show a certain microscopic character not seen in St. Vincent Arrowroot, but no confirmation of such a difference was obtained.

Herbarium.

The end of 1927 saw the completion of the first part of the cabinet extension programme, namely, the provision of two additional cabinets in each cabinet-block, the extra space being provided by the removal of the old 4in. water pipes and the screwing together of the existing cabinets. A commencement was, moreover, made with the postponed part of the programme, namely, the insertion of extra cabinets on the top of existing blocks on the ground and first floors. As soon as the new cabinets had been placed in position the specimens

were spaced out so that the accumulation of mounted material from the Store could be incorporated. As a result it was possible to "lay in" during 1927 a total of 68,057 sheets, about two-thirds of this total representing Store material.

With regard to publications reference should be made to the Flora of West Tropical Africa, of which Part i of Vol. i appeared during the year (*see* p. 26). The taxonomic work published by members of the staff and visiting botanists is alluded to below under the respective geographical headings, but mention may be made here of other publications not assignable to any particular area. "The Morphology and Taxonomic Position of the Adoxaceae" (*Journ. Linn. Soc.* 47, p. 471), "The Genera of Magnolieae" (*K.B.* 1927, p. 257), "Contributions towards a Phylogenetic Classification of Flowering Plants: vi" (*K.B.* 1927, p. 100), and "Decades Kewenses" Nos. cxvi-cxviii, were contributed by members of the staff. The Director published "The genus Lilaeopsis: a Study in Geographical Distribution" (*Journ. Linn. Soc.* 47, p. 525), and Sir George Watt furnished a paper on "Gossypium" consisting of notes on certain specimens of cultivated and wild cottons preserved in the Herbaria of the Royal Botanic Gardens of Kew and Edinburgh (*K.B.* 1927, p. 321). A lecture delivered by Miss M. L. Green, on "The History of Plant Nomenclature," in connection with the Board of Education's Short Course in Botany for Teachers in Secondary Schools held at Kew, was also published in a slightly modified form (*K.B.* 1927, p. 403).

Europe and the Orient.—*Routine.*—Approximately 10,000 sheets of newly mounted material have been incorporated, about 7,000 of which were from the Store. Numerous genera have been written up according to recent monographs or standard floras; those dealt with this year include *Scabiosa* and allied genera, *Dianthus*, *Viola*, *Cirsium*, *Carduus*, *Alyssum*, *Chrysanthemum*, *Achillea*, *Anthemis* and *Hyoscyamus*.

Amongst collections which have been named mention must be made of Mr. B. Gilliat-Smith's North Persian plants (1927) and Mr. J. Gladstone's specimens collected on the St. Kilda Islands in July, 1927. An account of Mr. Gilliat-Smith's fine Persian collections is in preparation. Further material from the Balkan Peninsula has been received from various botanists, and a collection of plants from Greece (Bornmüller's Iter Graecum) has been purchased. The Rev. E. Ellman invited Mr. E. Nelmes to join him on a botanical collecting tour in Spain and the resultant collection, presented to Kew, supplements those made in previous years. Valuable critical material of the British flora has been contributed by Mr. Edgar Thurston and other British botanists, also by several members of the Herbarium staff, including 800 grasses by Mr. C. E. Hubbard. Some 500 sheets were prepared and laid in from specimens grown in the Experimental Ground. Mr. E. M. Marsden-Jones and Mr. W. B. Turrill have

presented 430 specimens of *Centaurea* and *Silene* in connection with their intensive work which is designed to throw light on critical taxonomic problems confronting the botanist dealing with the flora of Europe. These include representative pedigree material illustrating their genetical studies, and also specimens showing the distribution of wild varieties. Especially valuable are the series of varieties of *Silene maritima* from the south coast of England, *S. vulgaris* from the Balkan Peninsula, and *Centaurea* spp., varieties, and hybrids, from the Midland and Northern counties of England and from Scotland.

Research and Publications.—The following notes and papers have been published :—

" On the Flora of the Nearer East : iii " (*K.B.* 1927, p. 3). " The Forests of the Balkan Peninsula " (The Timber Trades Journal, September, 1927, p. 855).

Asia : Indo-Malayan Region.—*Routine.*—Mounting of specimens in the Store proceeded satisfactorily during the year. Practically all the Indian material has been mounted, though some 25,000 sheets of Malay Islands and Philippine Islands plants still remain. A large amount of " laying-in " has been achieved, though on account of the shortage of cabinets some 2,000 mounted specimens are temporarily sorted and still in the Store. The material incorporated included a large number of sheets from Siam with many type specimens named by Professor Craib, about 150 Siamese grasses, and most of the current collections mentioned below. A considerable number of duplicates, mostly Indian, were made available for distribution. About 19,000 sheets of the late Mr. J. S. Gamble's Herbarium were incorporated.

The restoration of the valuable Wallich Herbarium progressed steadily, but on account of the existence of many sheets under one number, the amount of labour involved proved greater than had been estimated. It is now approaching completion and the specimens have been made safe for a long period.

Contributions to the Herbarium were received from Mrs. A. D. Parry (Lushai Hills of Assam), Mr. C. E. Parkinson, Forest Botanist, Burma (mainly from South Tenasserim), Mr. R. N. Parker, Imperial Forest Botanist, Dehra Dun, and Mr. A. H. G. Alston, Systematic Botanist, Ceylon. Most of these have been named and incorporated. Mrs. Parry's and Mr. Parkinson's collections are of special interest, since they come from little-known regions, and the latter especially contained many new species. The South Indian collections have been enriched by about 300 sheets presented by the Royal Botanic Gardens, Calcutta, and about 150 sheets by the Madras Herbarium, all of which were laid in. Minor contributions were received from several other sources.

The Bourne Collection of South Indian plants is being used for the preparation of the Madras Flora. It is of great value in this

connection, and several species find a place in that Flora solely on the evidence of specimens collected by the donors, Sir Alfred and Lady Bourne. The sheets are being added to the general herbarium as the work of the Flora proceeds.

Research and Publications.—Work on the preparation of the Flora of the Presidency of Madras was continued, and nearly two-thirds of Part viii was set up in type by the end of the year.

The following papers were published :—

" Contributions to the Flora of Burma," Part ii (*K.B.* 1927, p. 81), Part iii (p. 203), Part iv (p. 310), by the Assistant for India, containing in all descriptions of 25 new species and 2 new varieties.

" Contributions to the Flora of Siam," Additamentum xx (Leguminosae) by Prof. W. G. Craib (*K.B.* 1927, p. 56) : Additamentum xxi (Rubiaceae) by Miss E. T. Geddes (*K.B.* 1927, p. 164) : Additamentum xxii (Orchidaceae) by Dr. A. F. G. Kerr (*K.B.* 1927, p. 212) : Additamentum xxiii (Connaraceae) by Prof. Schellenberg, and (Leguminosae) by Prof. W. G. Craib (*K.B.* 1927, p. 374) : containing in all descriptions of two new genera, 80 new species and three new varieties.

" The genus Dioscorea in Siam," by Sir D. Prain and Mr. I. H. Burkill (*K.B.* 1927, p. 225).

" The identity of Talauma Villariana," by Mr. J. E. Dandy (*K.B.* 1927, p. 419).

" Hydnocarpus, Taraktogenos and Asteriastigma from Burma," by the Assistant for India (*K.B.* 1927, p. 97).

" Santalum album in India " (*K.B.* 1927, p. 200).

China.—*Routine.*—With the exception of a portion of a set of plants collected by Mr. H. H. Chung of the University of Amoy, all the Chinese and Japanese collections in the Store have been mounted. The increased cabinet accommodation provided during 1927 has enabled practically the whole of the 8000 specimens referred to last year as temporarily arranged, to be laid in the Herbarium. Some 4400 others have also been incorporated, and 6800, about half of which have been temporarily sorted, have had to be held over for lack of cabinet accommodation. Apart from the naming of the large collections referred to below the routine work has been mainly concerned with the identifying of numerous garden specimens, and naming of smaller Chinese and Japanese collections in the Store.

Of the larger collections considerable time was spent over Père Licent's contributions from Northern China and Mongolia, and four further lists of identifications have been dispatched. A portion of Captain F. Kingdon Ward's last collection, made on his expedition to the frontiers of Burma and Tibet in 1926, has been named.

Research and Publications.—A complete enumeration, including descriptions of 54 new species and many new varieties, of the collection made by Captain Kingdon Ward in his Tibetan Expedition of 1924 and 1925 has been completed, and will shortly be published.

Work on the revision of the Asiatic species of the genus *Buddleia* has been continued, for which many of the types have been received on loan. In connection with the proposed monograph of the Asiatic species of *Gentiana*, the descriptions of 23 new species and 5 new varieties will shortly appear in the *Kew Bulletin*.

AFRICA.—*Routine.*—Very satisfactory progress was made in clearing the African section of the Store and practically all the old collections have now been mounted. Some 14,000 specimens, both old and recent, have been laid out and mounted during the year, of which about 5000 have been incorporated in the Herbarium. The remainder are housed in the Store. With regard to naming, the material needed for the Flora of West Tropical Africa was given preference.

In addition to the rearrangement of covers carried out as a matter of routine during the progress of the Flora of West Tropical Africa, the species of some of the larger genera have been divided up into the five regions of the proposed Regional Floras of Tropical Africa. This subdivision, when fully carried out, will greatly facilitate the naming and laying in of Tropical African plants. In this connection it might be mentioned that the whole of South West Africa and of Bechuanaland is now included in the South African covers.

About 4500 specimens were received for identification during the year, chiefly from Tanganyika Territory and the West African Colonies, but also from Kenya, Uganda and South Africa. As they were received in comparatively small consignments the naming involved a considerable expenditure of time, especially as a large number required very critical examination. The Assistant for South Africa was able to deal fairly promptly with the material sent from various parts of the Union of South Africa.

With regard to grasses, 800 sheets have been named and laid in, including a collection of 253 made by Messrs. T. D. Maitland and J. D. Snowden in Uganda, which forms a valuable addition to material from that Protectorate. The African species of *Sporobolus* were arranged after Miss S. Stent's revision in "Bothalia."

Work has also been continued on African orchids, especially on a collection from Katanga.

Research and Publications.—Research was concentrated on the Flora of West Tropical Africa, and the second Part of Volume i, which completes the Archichlamydeae, is now ready for the press. This Part includes several families of great economic importance, which were much in need of revision. Amongst these may be mentioned *Caesalpiniaceae*, *Mimosaceae*, *Papilionaceae*, *Meliaceae*, *Simarubaceae*, *Anacardiaceae*, and *Sapindaceae*.

The Assistant for South Africa completed her revision of *Crotalaria* from South and South Tropical Africa, in connection

with which a large number of specimens were received on loan from continental herbaria.

An enumeration of the Flora of the Seychelles Archipelago is being prepared. This necessitates the revision of two large collections made by J. Horne (in 1873-5) and Prof. J. Stanley Gardiner (Sealark Expedition, 1908), and of many small collections subsequently made by Mr. R. Dupont and M. H. P. Thomasset.

Work on the Grasses for Part 5 of Volume ix of the Flora of Tropical Africa has proceeded steadily during the year.

With regard to publications, the first Part of Volume i of "The Flora of West Tropical Africa," containing the families *Cycadaceae-Tiliaceae*, was issued in March, 1927.

Other publications included a Memoir by the Assistant Director entitled "The Gold Coast Forest: a study in Synecology," (*Oxford Forestry Memoirs* No. 7); a second part of "East African Pasture Plants," containing descriptions and figures of 30 East African Grasses, obtainable from the Crown Agents for the Colonies; and the following papers:—"Notes on African Grasses: iv" and "v" (*K.B.* 1927, p. 72 and p. 264), "Tropical African Plants: i" (*K.B.* 1927, p. 150), "African Orchids: i" (*K.B.* 1927, p. 415).

America.—*Routine.*—Substantial progress was made with the Store work, nearly 18,000 sheets being mounted, and about 11,800 laid in. The task of naming and incorporating the large South American collections proceeded satisfactorily, the most valuable body of material made available for study being, perhaps, the extensive set of Hassler's Paraguay plants, which, as originally received, was largely unnamed. This collection possesses special importance since it is by far the largest hitherto made in Paraguay, and forms the basis of much of our knowledge of the flora of that country. Many of the specimens are type-numbers of new species described in the Bulletin de l'Herbier Boissier and elsewhere. Satisfactory progress was also made with Lehmann's Andine collection, over 1000 sheets being named, and about the same number of duplicates being prepared for distribution. The fine set of plants of the Argentine Andes brought back by Mr. H. F. Comber received special study.

In connection with the preparation of a Flora of Trinidad various parcels of critical plants from Trinidad and Tobago were determined. Collections from British Guiana, Brazil, Uruguay and Patagonia were among those named in the course of ordinary routine. In addition to several thousand sheets of Hassler's Paraguay plants, named provisionally with a view to rapid incorporation in the Herbarium, over 2000 specimens from other countries were determined.

The work of writing up the larger American genera in the Herbarium according to the most recent floras and monographs was continued; among the genera dealt with were *Solanum*, *Viguiera*,

Lisianthus, *Quercus*, *Ribes*, various members of the *Aristolochiaceae*, *Asclepiadaceae*, *Ranunculaceae*, *Anonaceae*, and *Menispermaceae*.

Research and Publications.—The receipt of a set of species of *Strychnos*, known in British Guiana as " Devil-doer " on account of their poisonous properties, led to a revision of the material in the herbarium, and the description of a number of hitherto unknown species. The results were incorporated in a paper " New Species of Strychnos from Tropical America " (*K.B.* 1927, p. 127). Some of the more outstanding novelties of Mr. Comber's Argentine collection mentioned above were described in " New Species from the Andes of Argentina " (*K.B.* 1927, p. 174).

A paper by Mr. L. A. M. Riley, describing various interesting new plants gathered by himself and others during the " St. George " Pacific Expedition, was published under the title " New Species from Panama, Coiba, and Cocos Islands " (*K.B.* 1927, p. 119).

Australia.—*Routine.*—A considerable amount of time has again been spent in writing up Australian material already in the Herbarium, according to the recent floras or monographs. The families from *Ranunculaceae* to *Compositae* were completed in this respect.

The increase in the number of queries mentioned last year has been maintained, and has given rise to points requiring a considerable amount of critical investigation, though at the same time much valuable material has been acquired for the Herbarium. Mr. C. T. White sent a collection of duplicate material of *Ficus* in spirit from Papua, collected by Mr. L. J. Brass, which will be worked out and named as soon as possible. A number of grasses was also forwarded, including 45 sheets of *Stipa* from South Australia and 35 sheets of *Astrebla* from Queensland. A collection of 212 specimens (chiefly from Western Australia) was received for determination from the Hon. Lady Evelyn Cecil. The general work of naming Australian specimens progressed satisfactorily and some 1900 sheets have been mounted and laid in. A number of mixed duplicates was presented from various sources, particularly from Mr. C. T. White, Dr. F. A. Rodway and Mr. F. J. Rae.

Research and Publications.—A revision of the Australian genus *Astrebla* is being prepared for publication and a manuscript copy of the revised descriptions was forwarded to the Government Botanist for Queensland for immediate use. The work of revising the Australian species of *Frankenia* has been completed and will shortly be submitted for publication. A considerable number of alterations of generally accepted views of the species of the genus has been necessary, and some twenty novelties have been described.

The following paper was published during the year :—" Santalum, Eucarya and Mida " (*K.B.* 1927, p. 193).

New Zealand.—*Routine.*—The work in the New Zealand Section during 1927 consisted of routine correspondence, the naming of a small collection made by the Hon. Lady Evelyn Cecil, and the rearranging and writing up according to recent works of the whole of the New Zealand material in the Herbarium from *Ranunculaceae* to *Compositae*.

Research and Publications.—The following paper was published :—" The type of Veronica Traversii " (*K.B.* 1927, p. 395).

Polynesia.—*Routine.*—The Polynesian material from *Ranunculaceae* to *Compositae* has been written up and rearranged. A collection made by Mr. J. P. Mead was named, and a certain amount of work was carried out on Mr. W. Greenwood's plants from Fiji.

Research and Publications.—A paper entitled " The Grasses of the Fiji Islands," which includes a key, short descriptions, and notes, was published (*K.B.* 1927, p. 18.)

Ferns, Mosses and Liverworts.—During 1927 about 3000 sheets of ferns have been laid in. The writing up of specimens according to Dr. C. Christensen's Index Filicum has been continued. While this has been done at various points to facilitate the naming of the more frequently occurring species, most progress has been made with *Eudryopteris* (*Lastrea*).

Collections, such as those from China by W. Hancock and J. Cavalerie, and from Colombia by E. André, of which duplicates were distributed under provisional names a few years ago, are being re-examined and several lists of revised determinations have been distributed. This work is still proceeding, as is also the naming of other large collections made in Siam by Dr. A. F. G. Kerr, and in Mongolia and Northern China by Père E. Licent. The ferns of the following collections have been named :—Mrs. A. D. Parry, Lushai Hills, Assam ; Captain F. Kingdon Ward, Tibet, etc. ; Mr. W. R. Price, Formosa ; Mr. F. R. Irvine, Gold Coast ; Mr. F. C. Deighton, Sierra Leone ; Mr. K. E. Toms, Zanzibar ; Mr. R. A. Altson, British Guiana ; and, from the Store, Dr. A. W. Hill, Andes ; Mr. W. R. Price, Formosa.

A few specimens of Mosses and Liverworts have been named and laid in.

Algae and Lichens.—Several miscellaneous collections of Marine Algae were received for identification, the most noteworthy being specimens from the Gulf of Suez, collected by Mr. N. Douglas Simpson, and from the Sind Coast by Mr. Y. V. Paul, and a selection of interesting and critical specimens from New Zealand forwarded by Mr. R. M. Laing. In addition to these, there were the usual enquiries regarding smaller collections of Marine and Freshwater Algae. A number of sheets of *Rhodophyceae* from Bombay and Karachi were

sent on loan to Dr. F. Börgesen, who has accepted an invitation from the University of Bombay to visit Bombay and study the algae of that coast.

The Biological Department of Dalhousie University, Halifax, Nova Scotia, having decided to specialize in Marine Algae, and being desirous of co-operating with other institutions, presented, through Prof. I. H. Ball, the first instalment of a collection of Marine Algae from the Nova Scotian coasts. The donation will form a very valuable addition to the Herbarium.

Kew is again indebted to Mr. R. Paulson, who on the occasion of his weekly visits has given voluntary assistance in the naming of many lichens, especially collections from the Bahamas sent by Mr. L. J. K. Brace, from Abyssinia by Mr. J. Omer Cooper, and various critical specimens. Several collections of Lichens, including E. André's South American series, have been incorporated.

Fungi.—The routine work of miscellaneous enquiries, and requests for determinations and for specimens on loan, continues to be heavy. In matters of taxonomy and nomenclature assistance has been given to officers of the Ministry of Agriculture and Fisheries at Advisory Centres; and also to authors of papers both at home and abroad.

Among collections named during the year have been fungi from South Africa (P. A. van der Bijl), India (S. R. Bose), Uganda (C. G. Hansford), Dunk Island, North Queensland (W. Cottrell-Dormer), and North America (E. M. Wakefield). Several large collections, however, still await determination.

In addition to those mentioned above, a number of fungi have been laid in, including Philippine material (Elmer), Mycotheca Carpatica (Petrak), Fungi Exotici (Sydow, 4 fascicles), and some 130 British specimens.

Considerable time has been spent in ascertaining the exact nomenclature of pathogenic fungi for a list of British plant-diseases, which is in preparation by the sub-committee for Plant Pathology of the British Mycological Society. The need of the list was pointed out by the officers of the Ministry of Agriculture and Fisheries, and by the Director of the Imperial Bureau of Mycology, and its preparation has been recognised by the Imperial Agricultural Research Conference, 1927.

A card catalogue, already in use in the Herbarium, of fungi parasitic on ornamental or forest trees in Western Europe, has been considerably extended as a result of an enquiry by the Forestry Commission, and the possibility of its publication is being considered.

In connection with the outbreak of the new Douglas Fir disease, caused by the fungus *Rhabdocline pseudotsugae*, a visit was paid by the Keeper to Dawyck (Peeblesshire), where the original outbreak occurred, and subsequently to Kemsing (Kent), and Oxford, where the disease was discovered for the first time this season.

Research and Publications.—The work on the genera *Vermicularia* and *Colletotrichum* was concluded and the manuscript has been sent to the press.

The following papers were published during the year :—" Studies of Rhizoctonia Crocorum (Pers.) DC. and Helicobasidium purpureum (Tul.) Pat." (Trans. Brit. Myc. Soc. xii, p. 116). " The genus Cystopus in South Africa " (Bothalia ii, p. 242).

STOREHOUSE.—The allocation of the Store staff was the same as in 1926, though there were several changes in the personnel. In spite of this the rate of laying-out and mounting was more rapid than in any previous year.

In the Asiatic Room almost all the Chinese and Indian material has been mounted and in the African Room all the Tropical African and South African material. Practically all the Australian material has also been dealt with. Very large collections in the European and American Rooms still remain to be mounted, and in the Asiatic Room material from the Malay Islands and Philippine Islands. In the Cryptogamic Section many collections of ferns, lichens, mosses and hepaticae remain practically untouched. The figures in the table below include work accomplished by the Store staff ; other references to the Store work will be found under the respective geographical headings.

SUMMARY OF ROUTINE.—The following table summarises the routine work, apart from naming, accomplished by the regular staff and by the special Store staff during 1927, excluding the lower cryptogams.

Mounted	100,630
Incorporated	68,057
Duplicates distributed	3,790
Specimens received on loan ...	5,552
Specimens sent out on loan ...	3,132

SEEDS AND CARPOLOGICAL COLLECTIONS.—About 250 boxes of seeds have been added to the Seed Collection from various sources. These included a valuable set from Ceylon presented by Mr. A. H. G. Alston.

The provision of a new table case in the West Wing of the Herbarium has allowed 150 boxes of somewhat bulky fruits and seeds to be incorporated in the Carpological Collection. The specimens are mainly Monocotyledons.

COLLECTION OF DRAWINGS AND PHOTOGRAPHS.—Between three hundred and four hundred drawings were laid in. These consisted mostly of current material, but a certain amount of progress was made with arrears. Of collections received during the year mention may be made of a fine set of orchid drawings by the late Edward

Smith, of Fir Vale, Sheffield, presented by the Representatives of the late Richard Ford Smith, who had received them from Miss Margaret Harker Smith ; a set of enlarged photographs of Argentine Andes plants and vegetation purchased from Mr. H. F. Comber, illustrative of his second Expedition (1926) to that region ; and a collection of photographs taken by Dr. D. Fairchild on the Allison V. Armour Expedition (1926-7) to West Africa, presented by the National Geographical Society of the U.S.A. Flowers and foliage are very well represented in the Herbarium collection of illustrations, but the extension of this collection by the addition of photographs of entire plants and plant societies is of great importance. A valuable series of photographs of old type specimens preserved in various herbaria throughout the world was presented by the U.S. National Museum, Washington.

Nomenclature.—Preparations for the International Botanical Congress, to be held in England in 1930, were continued during the year. During the last decade there has been an increasing body of public opinion in favour of such modification of the International Rules (ed. 2, 1910) as would lead to greater certainty and uniformity in their application. The subject has been discussed in botanical journals, and was debated at the Imperial Botanical Conference (London, 1924), and the International Congress of Plant Sciences (Ithaca, 1926). At the latter Congress an International Committee was appointed to consider proposals for emending the Rules, and to make recommendations to the International Congress to be held in 1930. A large amount of preparatory work necessary in this connection is being undertaken at Kew, amongst other problems the typification of generic names, and the preparation of a list of additional Nomina Generica Conservanda.

As a result of discussion at Ithaca and of subsequent correspondence, it was decided, on the proposal of Professor Hitchcock of the United States Department of Agriculture, to attempt to secure the agreed typification of Linnean generic names of Phanerogamia published in Sp. Pl. ed. 1, and Gen. Pl. ed. 5. An extensively annotated list of suggested standard-species for the names in question has accordingly been prepared, the first 500 genera having been worked out by Professor Hitchcock, and the remaining 555 by Miss M. L. Green. The joint list will be published and distributed for suggestions and criticisms to all botanists interested before being brought before the International Committee on Nomenclature.

As mentioned last year, a schedule containing thirty-one suggested new Nomina Generica Conservanda (with the reasons for their conservation) was sent to the members of the International Committee and to other botanists. Judging from the replies received, the schedule as a whole appears to have met with approval.

As illustrating the importance and urgency of work of this nature, the discovery that the name *Epidendrum* as now used was

found to be technically inapplicable may be cited. The placing of this name on the Nomina Conservanda list will save unnecessary name-changes in a genus of about 750 species. An annotated list of twenty additional names has been received from Dr. Elmer D. Merrill, including those of such large and important genera as *Loranthus*, *Lasianthus* and *Gardenia*.

A certain amount of time has been given to correspondence with regard to technical difficulties on points of bibliography, nomenclature, and searching for plant names not easily traced. Enquiries were also received from botanists as to the correct names under International Rules of numerous genera, and some of the results of the investigations undertaken in this connection were embodied in the following papers :—

"*Atylosia* or *Cantharospermum*" (*K.B.* 1927, p. 134) ; "*Paphiopedilum* and *Phragmopedilum*" (*K.B.* 1927, p. 306) ; "*Aplostellis* and *Corymbis*" (*K.B.* 1927, p. 363) ; "*Cerefolium* Haller" (Journ. Bot. 1927, p. 15) ; "*Alibertia* or *Cordiera*" (Journ. Bot. 1927, p. 16) ; "*Tunica* Mert. et Koch" (Journ. Bot. 1927, p. 225).

Index Kewensis.—During the past year the compilation of the Seventh Supplement (1921-25) of the Index Kewensis has been proceeding steadily, and between 9000 and 10,000 entries have been added to the card catalogue. The reduction in the number of entries, as compared with last year's, was chiefly owing to the fact that the most important books and periodicals and also those containing the greatest number of new names are on the whole examined first and the new names extracted in order that they may be available for consultation. During the past year works have been examined which contain a smaller number of new names, and the search for the obscure few often entails a vast amount of time. All the Russian works concerned have been dealt with in 1927. Apart from the current literature several older works containing names omitted from the Index Kewensis have been examined, one of which, Lavallée, Arboretum Segrezianum, 1877, was found to contain some 350 new names. It is expected that Supplement VII will be ready for the press by the autumn of 1928.

Experimental Ground.—The existing plot having proved its value, an extra piece of ground on the south side has been dug up and incorporated. Investigations were continued on *Silene* varieties and on *Epilobium angustifolium*. Critical material of *Silene*, *Centaurea*, *Inula*, *Hieracium*, *Cistus*, *Agropyron*, and species of *Verbascum* (some not previously represented at Kew) were studied and sheets prepared for the Herbarium.

Work was commenced on propagating pure lines of material of *Silene*, *Centaurea* and *Plantago* for the Transplant Committee of the British Ecological Society. The purpose of this Committee, which was formed at the instigation of the Director, is to direct and

superintend experiments with material of pure lines grown in various localities possessing different conditions of soil and climate. The preliminary experiments are being made at Potterne by the courtesy of Mr. E. M. Marsden-Jones, with control experiments at Kew, and as the research proceeds a selection of specimens will be dried and kept at the Herbarium so that a complete record may be preserved. The experiments are planned to last ten years in the first instance, and are likely to be of a very comprehensive nature.

Visitors.—About 4712 visits have been made to the Herbarium during the year. The work carried out by visitors covered as usual a very wide field, as is indicated in the outline given below.

Dr. O. Stapf and the staff working under him on the Botanical Magazine, and on the new edition of Pritzel's Index Iconum, were again accommodated in the Library. The latter work, which will bear the title "Iconum Botanicarum Index Londinensis," is now nearing completion, and a note as to its scope and the principles adopted in connection with the revision has been published (*K.B.* 1927, p. 366). Kew is indebted to Dr. Stapf for help received with regard to various questions, particularly in connection with the genus *Ephedra*.

Various members of the staff of the Botanical Department of the British Museum (Natural History) visited the Herbarium repeatedly in connection with their work, as did Mr. E. W. Mason and other workers from the Imperial Bureau of Mycology. Mr. E. D. Darlington, of the John Innes Horticultural Institution, paid visits in connection with investigations on *Prunus* species, and British botanists were chiefly represented by Messrs. C. E. Salmon, J. Fraser, E. Thurston and E. M. Marsden-Jones. On the cryptogamic side Prof. F. O. Bower was at Kew on several occasions studying ferns, and Mr. H. N. Dixon and Mr. R. Paulson paid frequent visits in connection with their work on Mosses and Lichens respectively, whilst Mr. W. B. Grove spent about a fortnight at Kew in September studying fungi.

India was represented by Mr. C. E. Parkinson, Forest Botanist, Burma, who spent the last four months of the year at Kew working at the flora of Burma, especially forest plants; and by Dr. S. K. Mukerji, Lecturer at Lucknow University, who had been engaged in ecological research at University College, London, for two years, and who paid many visits to the Herbarium in connection with his studies on the genus *Mercurialis* and on the flora of Kashmir. Captain F. Kingdon Ward was a frequent visitor and assisted in naming the plants collected during his 1926 expedition to Burma and Tibet.

Mr. H. F. Macmillan, of the Anglo-Persian Oil Company, visited Kew repeatedly with reference to plants collected by him in S. W. Persia.

Considerable attention was again paid to the flora of the Malay region; Mr. R. E. Holttum, Director of the Botanic Gardens, Straits Settlements, spent part of his leave at the Herbarium studying Malayan ferns. Mr. H. N. Ridley was at Kew most of the year continuing his work on Malay plants and the problems of seed distribution. Mr. I. H. Burkill, also a regular visitor, continued his work on a "Dictionary of Economic Plants of the Malay Peninsula," in which he was again assisted by Dr. D. Hooper, late Curator of the India Museum, Calcutta. Thanks are due both to Mr. Ridley and Mr. Burkill for assistance rendered in connection with questions on Malayan plants. Miss E. T. Geddes spent the second year of her tenure of the Senior Kilgour Scholarship at Kew, as approved by the authorities of the University of Aberdeen, and continued work until the middle of July on the flora of Siam. During this period most of her time was spent on the families *Melastomaceae* to *Rubiaceae*.

Professor Schellenberg, of the University of Göttingen, spent nearly two months in England, being engaged on his revision of the *Connaraceae*.

Professor G. Koidzumi, of Kyoto, spent some time in the Herbarium working at the native flora of Japan, and Dr. T. Tanaka paid another visit to Kew in connection with his work on *Citrus*. Mr. W. R. Price visited the Herbarium on several occasions in continuation of his work on his collection of plants from Formosa.

Professor C. E. Moss, of the University of the Witwatersrand, Johannesburg, was at Kew the first month of the year working out South African species of *Compositae* and *Chenopodiaceae*. Miss D. M. Cory, of Grahamstown, also spent some time at Kew working on South African plants. Throughout the year Mr. N. E. Brown was a visitor at the Herbarium and was engaged chiefly on work on the genus *Mesembryanthemum* and on South African *Iridaceae*. Miss M. A. Pocock, of Cape Town, visited the Herbarium in connection with plants collected by her in Angola. Mr. R. E. Vaughan, of the Royal College, Mauritius, during his year of study in England, spent many weeks in the Herbarium naming his collection of Mauritian plants; and Mr. E. F. S. Shepherd, Botanist and Mycologist to the Department of Agriculture, Mauritius, worked at Kew in the autumn, especially in connection with the literature of tropical mycology. Mr. K. E. Toms worked at the Herbarium for several weeks identifying his Zanzibar collections. Mr. T. D. Maitland, Superintendent of the Botanic Gardens, Victoria, Cameroons, paid frequent visits, working chiefly at Grasses collected by him in Uganda. Mr. P. J. Greenway, of the Imperial Forestry Institute, Oxford, paid repeated visits to Kew, chiefly in connection with the forest flora of West Africa.

Professor A. H. R. Buller, of the University of Manitoba, Winipeg, was at Kew for about two months in the summer, and was engaged in bibliographical work.

Mr. H. F. Comber paid several visits in connection with the working out of his collection from the Argentine Andes, and Mr. L. A. M. Riley spent several weeks at Kew preparing his paper on "New Species from Panama, Coiba and Cocos Islands."

The United States of America were represented by a number of visitors. Prof. B. L. Robinson, Curator of the Gray Herbarium, Harvard University, visited Kew for a short period in July, studying especially the genus *Eupatorium*. Mr. and Mrs. Carl Epling, of the University of California, Berkeley, arrived in August and worked on the American *Labiatae* until the end of the year. Prof. W. Trelease, late of the University of Urbana, Illinois, paid two visits during 1927, and continued his study of South American *Piperaceae*. Dr. Ivan Johnston, of the Gray Herbarium, was at Kew during September, working at the flora of Chile and the *Boraginaceae* of South America; and Dr. H. Castle, of Yale University, who is in Europe studying type specimens of Hepaticae, was at Kew for two or three weeks in September. Dr. W. A. Cannon, of the Carnegie Institution of Washington, Tucson, Arizona, spent several weeks in the Library in connection with the ecology of the Mediterranean flora.

Mrs. Clement Reid and Miss M. E. J. Chandler continued their studies on Oligocene and Eocene fruits and seeds, and made several stays at Kew during the year.

Mr. G. M. Sprague visited the Herbarium in November and December, being engaged on work on the botany of Otto Brunfels' Herbal and Caspar Bauhin's Pinax. Mention must also be made of Miss Muriel Whiting, who again generously gave her services for several months of the year in connection with the rearrangement and working out of Malayan material.

Additions to Herbarium.—The total number of specimens received during 1927 was about 26,750, of which 2346 were purchased. The chief sources from which they were obtained were as follows:—

Europe.—*Presented*: Great Britain, by Messrs. J. Gladstone, C. E. Hubbard, E. M. Marsden-Jones, V. S. Summerhayes, E. Thurston, W. B. Turrill and The Watson Exchange Club (per Mr. D. G. Catchside); Spain, (coll. the Rev. E. Ellman and Mr. E. Nelmes) by the Rev. E. Ellman, and (coll. Don Carlos Pau) by Mr. N. Y. Sandwith; Sweden, by Dr. G. Samuelsson and Mr. Carl G. Alm; Czechoslovakia, (coll. Dr. J. Podpera) by Brno University; Roumania, Florae Roumaniae Exsiccatae, Cent. 7, by Prof. A. Borza; Russia, by Prof. B. Fedtschenko, Mrs. E. M. Reid (seeds); Poland, Warsaw University (fungi); Latvia, Riga University (algae); European Artemisias, by Prof. R. Pampanini.

Purchased: Mr. D. McArdle, Irish Mosses; Dr. F. Petrak, Mycotheca Carpatica fasc. 17-19 (Nos. 401-475); Messrs. A.

Fiori and A. Béguinot, Flora Italica Exsiccata, Cent. 29–30; Mr. T. O. Weigel, Bornmüller, Iter Graecum: Mr. G. V. Keintz, Crimean plants.

ORIENT.—*Presented*: Palestine, (coll. Mr. F. J. Tear) by Department of Agriculture, Palestine; Persia, by Capt. B. Stuart Horner and Mr. B. Gilliat-Smith; Cyprus, by Mr. A. Huddle.

NORTH ASIA.—*Presented*: Siberia, by Tomsk University; Turkestan, by the Central Asia University, Taschkent.

CHINA.—*Presented*: (coll. Mr. G. Forrest) by the Royal Botanic Garden, Edinburgh, Prof. H. Handel-Mazzetti, (coll. Mr. R. C. Ching) by Dr. H. H. Hu, the Abbé E. Licent, Dr. J. C. Lui; Western China, by Capt. F. Kingdon Ward and the Natural History Museum, Vienna.

INDIA AND CEYLON.—*Presented*: Assam, by Mrs. A. D. Parry; Burma, by Mr. C. E. Parkinson; Burmese orchids, by the late Mr. R. C. J. Swinhoe; Karakoram, (coll. Mr. R. C. Clifford) by Major K. Mason; various, by Mr. R. N. Parker and the Rev. E. Blatter; Ceylon, (coll. Mr. A. H. G. Alston) by the Department of Agriculture, Peradeniya.

Purchased: Mr. G. O. Allen, Indian Charophyta.

MALAY PENINSULA.—*Presented*: Various, by the Director, Botanic Garden Department, Straits Settlements.

INDO-CHINA.—*Presented*: Siam, by Mrs. D. J. Collins, Mr. H. B. G. Garrett, (coll. Dr. A. F. G. Kerr and Nai Put) by Dr. A. F. G. Kerr, (coll. Phra Winit Wanadorn) by the Siam Forestry Service, and Dr. Eryl Smith.

MALAY ISLANDS.—*Presented*: Java, by the Director, Botanic Garden, Buitenzorg.

Purchased: Borneo, Mr. A. D. E. Elmer.

NEW GUINEA.—*Presented*: (coll. Mr. L. J. Brass) by Mr. C. T. White.

Purchased: (coll. D. R. Schlechter) the Director, Botanic Gardens, Berlin.

POLYNESIA.—*Presented*: Fiji, by Mr. W. Greenwood.

AUSTRALIA.—*Presented*: New South Wales, by Dr. F. A. Rodway; Queensland, by Mr. C. T. White; Victoria, by the National Herbarium of Victoria; Western Australia, (coll. Dr. C. H. Ostenfeld) by the Universitetets botaniske Museum, Copenhagen; various, by the Hon. Lady Evelyn Cecil and Mr. C. T. White.

TROPICAL AFRICA.—*Presented*: Abyssinia, by Dr. Hugh Scott and Mr. J. Omer Cooper; Gold Coast, by Mr. F. R. Irvine, Sir A. Kitson; Kenya, (coll. Mr. H. M. Gardiner) by the Department of Agriculture; Liberia, (coll. Mr. J. Linder) by the Arnold Arboretum; Nigeria, by the Forestry Department; Nyasaland,

(coll. Mr. A. Stolz) by the Bentham Trustees; Rhodesia, (coll. Mr. F. Eyles) by the Department of Agriculture; Sierra Leone, (coll. Mr. F. C. Deighton) by the Department of Agriculture; Tanganyika, (coll. Messrs. D. K. S. Grant, A. E. Haarer and T. H. Marshall) by the Department of Agriculture, and (coll. Mr. B. D. Burtt) by the British Museum (Natural History); Zanzibar, by Mr. K. E. Toms; Uganda, (coll. Messrs. T. D. Maitland and J. D. Snowden) by the Department of Agriculture; West Coast, (coll. Dr. J. M. Dalziel) by Mr. Allison V. Armour.

MASCARENE ISLANDS.—*Presented*: Mauritius, by Mr. R. E. Vaughan.

SOUTH AFRICA.—*Presented*: Cape Province, by Mrs. M. R. Levyns; various, by Dr. J. Burtt Davy and the Division of Botany, Pretoria.

Purchased: Various South African Plants, Mr. N. S. Pillans.

NORTH AMERICA.—*Presented*: United States, by the University of California, U.S. Department of Agriculture, the Gray Herbarium, the U.S. National Museum, (coll. Mr. Kirk Whited) by Dr. L. H. Pammel, and (coll. Mr. J. A. Kusche) by Miss A. Eastwood; Canada, by Miss C. Rogers and Miss G. Dorrien Smith; Alaska, by Miss C. Rogers and Miss G. Dorrien Smith, and (coll. Mr. H. L. Mason and Mr. G. Halsey) by Miss A. Eastwood; British Columbia, by the Royal Horticultural Society; various, by the U.S. National Museum.

Purchased: Mr. B. F. Bush, U.S.A. plants.

CENTRAL AMERICA.—*Presented*: Mexico, Mosses (coll. the Rev. L. Arsène) by the U.S. National Museum.

WEST INDIES.—*Presented*: Trinidad, by the Forestry Department, Mr. L. A. M. Riley, and (coll. Mr. R. O. Williams) by the Department of Agriculture.

EAST TROPICAL SOUTH AMERICA.—*Presented*: British Guiana, (coll. Mr. R. A. Altson) by the Department of Science and Agriculture; Brazil, by Mr. C. L. Collenette, Miss G. Dorrien Smith, Mr. B. G. C. Bolland, and (coll. Dr. P. Dusén and Dr. G. Samuelsson) by the Rijks Museum, Stockholm.

WEST TROPICAL SOUTH AMERICA.—*Presented*: Costa Rica, (coll. Dr. P. C. Standley) by the U.S. National Museum; Peru, by Dr. Francis W. Pennell.

Purchased: Bolivia, (coll. Dr. J. Steinbach) Botanic Gardens, Berlin.

TEMPERATE SOUTH AMERICA.—*Presented*: Argentina, (coll. Dr. J. A. Schafer) by the New York Botanical Garden; Chile, by Dr. Francis W. Pennell; Uruguay, by Dr. F. Felippone.

Purchased: Chile, (coll. Dr. E. Werdermann) Botanic Gardens, Berlin.

Distribution of Duplicates.—The following were the principal institutions to which duplicates were distributed :—

Great Britain and Ireland.—Aberdeen, Cruickshank Botanic Gardens ; Cambridge University, the Botany School ; Dublin, Trinity College, Botany Department ; Edinburgh, Royal Botanic Garden ; London, British Museum (Natural History) ; Manchester, the University, Botanical Department ; Oxford, Imperial Forestry Institute.

Europe.—Berlin, Botanic Gardens and Museums ; Brno, Masaryk University ; Copenhagen, Botanic Institute ; Leningrad, Principal Botanic Garden ; Paris, École des Hautes Études ; Sofia, the University, Botanical Department ; Stockholm, Riksmuseet ; Zürich, Botanic Garden and Museum.

Africa.—Cape Town, South African Museum ; Bolus Herbarium.

Australia.—Melbourne, National Herbarium of Victoria.

America.—University of California ; Gray Herbarium, Harvard University ; Philadelphia, Academy of Natural Sciences ; Washington, D.C., U.S. National Museum.

The Library.

The following remarks refer to the more important presentations made to the Library.

Several periodicals in continuation have been presented as formerly by the Bentham Trustees ; also a copy of *Japanese Cherries*, by M. Miyoshi (1923?) ; this consists of 118 coloured figures in two oblong folio volumes, and an octavo volume of text in Japanese.

The Secretary of State for India has presented another volume of Sir William Foster's great work *The English factories in India*. The latest volume, which covers the years 1668 and 1669, is the thirteenth of the series. From the High Commissioner for India has been received a copy of the *Journal of Francis Buchanan kept during the survey of the district of Shahabad in 1812-1813*. This has been edited by C. E. A. W. Oldham, and was published at Patna in 1926.

From the Crown Agents for the Colonies :—6 copies of the first part of the *Flora of West Tropical Africa*, by J. Hutchinson and J. M. Dalziel ; a second part of *East African Grasses*, the text by C. E. Hubbard ; *Bulletin of the Geological Survey of Nigeria*, nos. 10 and 11 ; and an *Illustrated Guide to the Botanic Gardens, Singapore*, by I. H. Burkill.

The *Natural History Magazine*, now being issued by the British Museum (Natural History), of which four numbers have appeared, has been presented by the Trustees.

From the Council of the Royal Horticultural Society :—*Catalogue of the Lindley Library*, new edition, and the *Report of the Tulip Nomenclature Committee, 1914-15*.

The Carnegie Institution of Washington, through the kind offices of Dr. W. A. Cannon, has presented nos. 354 and 368 of its

Publications, these being Dr. Cannon's works: *General and physiological features of the vegetation of the more arid portions of Southern Africa*, 1924, and *Physiological features of roots with especial reference to the relation of roots to aeration of the soil*, 1925.

An Atlas of 41 large folio plates, with a quarto volume of text, illustrating and describing the dunes near Kootwijk, Holland, and their vegetation, has been published under the title: *De zandverstuivingen bij Kootwijk in woord en beeld*, by the State Forest Administration, Utrecht, from which a copy has been received.

The set of the *Perfumery and Essential Oil Record* in the library, which was deficient in the first three volumes and all issued after October, 1924, as well as in several numbers of other volumes, has been practically completed up to April, 1927, by Mr. Herbert C. Wright, whose valuable assistance was obtained through the kind offices of Mr. E. M. Holmes. The early volumes and many numbers of later volumes of this periodical are now out of print.

From Lieut.-Col. Sir David Prain:—The continuation of several periodicals including the *Berichte der Deutschen Botanischen Gesellschaft*, the *Bulletin de la Société Botanique de France*, and the *Proceedings of the American Philosophical Society*; also the *Year-book of Pharmacy . . and Transactions of the British Pharmaceutical Conference*, 1926.

Mr. I. H. Burkill has presented 22 volumes which include F. A. Buhse, *Die Flora des Alburs und der kaspischen Südküste*, 1899; F. Darwin and J. C. Willis, *Lecture notes on the natural history of plants*, [1892]; G. J. Radde, *Berichte über die biologisch-geographischen Untersuchungen in den Kaukasuslaendern*, 1866, several elementary textbooks of botany, and 30 maps, mostly of India.

An anonymous little volume entitled *The natural history of remarkable trees, shrubs and plants*, published in Dublin in 1819, has been presented by Mr. Arthur Osborn. There is some connection between it and Joseph Taylor's *Arbores mirabiles* (London, 1812), the remarks concerning several of the plants being exactly the same.

Books received from the Editor of *Nature*:—A. C. Beal, *The Gladiolus and its culture*; A. W. Darnell, *Winter blossoms from the outdoor garden*; R. R. Gates, *A botanist in the Amazon Valley*; R. W. Kolbe, *Die Kieselalgen des Sperenberger Salzgebiets* (*Pflanzenforschung*, herausg. von. R. Kolkwitz, Heft. 7); R. Morse, *British wild fruits and how to identify them*; A. I. Perold, *A treatise on viticulture*; H. Ross, *Die Pflanzengallen* (*Cecidien*) *Mittel- und Nordeuropas*, etc., zweite Auflage; J. C. Wister, *The Iris: a treatise . . . for the amateur gardener*.

Books received from their publishers for review in the *Kew Bulletin*. From Messrs. Arnold:—A. T. Johnson, *A garden in Wales*. From Messrs. Baillière, Tindall & Cox:—S. A. Waksman, *Principles of soil microbiology*; S. A. Waksman and W. C. Davison, *Enzymes: properties, distribution, methods and applications*. From

Messrs. Bale, Sons & Danielsson :—E. Blatter, *Beautiful flowers of Kashmir, illustrated*, vol. i. From Messrs. Benn :—J. Davidson, *Conifers, junipers and yew : Gymnosperms of British Columbia*. From the Clarendon Press :—G. Claridge Druce, *The flora of Oxfordshire*, ed. 2. From Messrs. Dulau :—G. C. Taylor and F. P. Knight, *The propagation of hardy trees and shrubs*. From Messrs. Macmillan :—A. Rehder, *Manual of cultivated trees and shrubs hardy in North America ;* F. F. Rockwell, (1) *The book of bulbs* ; (2) *Gladiolus* ; (3) *Shrubs* ; G. Stewart, *Alfalfa-growing in the United States and Canada*. From Mr. Humphrey Milford :—E. Blatter, *The Palms of British India and Ceylon*. From Messrs. Williams & Norgate :—*The gardener's year book*, 1927.

The following are independent works or in some cases separates from periodicals or other publications which have been presented by their authors unless otherwise stated :—J. R. Anderson, *Trees and shrubs, food, medicinal, and poisonous plants of British Columbia*, 1925 ; E. B. Babcock and R. E. Clausen, *Genetics in relation to agriculture*, ed. 2 (from Prof. Babcock) ; G. Beck, *Flora Bosnae, Hercegovinae et regionis Novipazar*, final part of the Choripetalae (from Director, Botanic Garden, Belgrad) ; L. Beille, *Précis de botanique pharmaceutique*, tome i, ed. 2, 1925 (from Dr. Otto Stapf) ; Elsdon Best, (1) *The Pa Maori* ; (2) *Maori agriculture*, 1925 (*Bulletin, Dominion Museum, New Zealand*, nos. 6 and 9, from Director) ; W. Bisiker, *Across Iceland*, 1902 (from Dr. A. W. Hill) ; F. Börgesen, *Marine Algae from the Canary Islands*, iii, pt. 1 ; J. Borg, *Descriptive flora of the Maltese Islands* ; L. Buscalioni and G. Muscatello, (1) *Studio Monografico sulle specie Americane del gen. Saurauia* ; (2) *Studio anatomo-biologico sul gen. Saurauia*, 1918 (both from *Malpighia*) ; M. E. J. Chandler, *The upper eocene flora of Hordle, Hants*, pt. ii, 1926 ; P. Choux, (1) *Le genre Secamone à Madagascar*, 1926 ; (2) *Les Sapindacées de Madagascar* (both *Mémoires de l'Acad. Malgache*) ; S. R. de Boer, *Respiration of Phycomyces* ; E. de Wildeman, *Plantae Bequaertianae*, vol. iii, fasc. 4 and vol. iv, fasc. 1–2, 1926-27 ; C. van Dillewijn, *Die Lichtwachstumsreaktionen von Avena* ; H. N. Dixon, (1) *Studies in the Bryology of New Zealand*, pt. iv (*Bull. New Zeal. Inst.* no. 3, pt. iv), 1926 ; (2) *Fossilium catalogus, plantae*, ed. W. Jongmans, pt. 13, *Muscineae* ; B. A. Fedtschenko and E. J. Bobrov, *Flora of the Cherepovets Government*, pt. 1 (in Russian) ; *Rhododendrons collected by G. Forrest* (1) *in 1924*, (2) *in 1925* (from Mr. Reginald Cory) ; L. Gibbs, *Common Hongkong ferns* ; *Letters of Sir Thomas Hanbury* (selected and arranged by Lady Hanbury), 1913 (from Mr. Cecil Hanbury) ; H. Handel-Mazzetti, *Systematische Monographie der Gattung Leontopodium* (from *Beih. zum Bot. Centralbl.*) ; A. Heintze, *Cormofyternas fylogeni* ; F. L. Herrera, *Chloris Cuzcoensis*, 1926 ; G. Herter, *Estudios botánicos en la región Uruguaya* (*Index familiarum plantarum Montevidensis*) ; K. Heyne, *De nuttige planten van Nederlandsch Indië*, 2e druk, 3 vols. (from Department of Agriculture, Buitenzorg) ; E. Hultén, *Flora of Kamtchatka and the*

adjacent islands, i (in *K. Svenska Vet.-Akad. Handl.* 3, v, no. 1); B. L. Issatchenko, *Études microbiologiques des lacs de boue* (mostly in Russian); A. B. Jackson, *Catalogue of the trees and shrubs in the collection of the late Lieut.-Col. Sir G. L. Holford*; J. P. Karthaus, *Het afsterven van stengels en knoppen bij de roode framboos*; M. Karsten, a series of articles on *Mesembryanthemum* in the Dutch periodical *Succulenta*; P. N. Kruilov, *Flora Altaya ī Tomskoĭ Ghubernīī*, 7 vols., 1901-14; A. G. M. Liernur, *Hexenbesen: ihre Morphologie, Anatomie und Entstehung*; T. M. Lowry and Sir John Russell, *The scientific work of the late Spencer Pickering, F.R.S.* (from the Royal Society of London); J. H. Maiden, *A critical revision of the genus Eucalyptus*, parts 67 and 68, 1926-27 (from Director, Botanic Gardens, Sydney); N. Malta, *Die Gattung Zygodon Hook. et Tayl.: eine monographische Studie*, 1926; N. B. Mendiola, *A manual of plant breeding in the tropics*, 1926 (from Dean of the College of Agriculture, Los Baños, Philippine Islands, through Mr. I. H. Burkill); J. G. Millais, *Magnolias*; Fr. Nábělek, *Iter Turcico-Persicum; plantarum collectarum enumeratio*, pts. ii-iii, 1925-26; T. Nakai, (1) *Flora sylvatica Koreana*, pts. xv-xvi, 1926-27; (2) *Lespedeza of Japan and Korea* (both from Forestal Experiment Station, Government-General of Chosen); T. Nakai and G. Koidzumi, *Trees and shrubs indigenous in Japan proper*, vol. i, by T. Nakai, revised and enlarged edition (from Prof. Nakai and Mr. S. Kawade); J. J. Nock, *Guide to the Botanic Gardens, Hakgala* (from Director of Agriculture, Ceylon); *North American Flora*, vol. 7, pt. 12 and vol. 34, pt. 4 (from Dr. N. L. Britton); *Nova Guinea: résultats des expéditions scientifiques à la Nouvelle Guinée*, vol. xiv, livr. ii (from Maatschappij ter Bevordering van het Natuurkundig Onderzoek der Nederlandsche Koloniën); S. O. F. Omang, *Die Hieraciumflora im Talgebiete Gudbrandsdalen*, i-ii, 1924-27; A. E. Osmaston, *A forest flora for Kumaon*; R. N. Parker, *A forest flora of the Punjab with Hazara and Delhi*, ed. 2, 1924; H. Perrier de la Bathie, *Le Tsaratanana, l'Ankaratra et l'Andringitra* (in *Mém. de l'Acad. Malgache*); A. Pfaeltzer, *Het vrucht- en bladvuur van de komkommer*; I. J. Ph. Pfeiffer, *De houtsoorten von Suriname*, dl. ii (from Koloniaal Instituut, Amsterdam); E. P. Phillips, (1) *A preliminary list of the known poisonous plants found in South Africa*, 1926 (from Dr. I. B. Pole-Evans), (2) *The genera of South African plants*, 1926 (these works are *Memoirs of the Botanical Survey of South Africa*, nos. 9 and 10); J. Pottier, *Recherches sur l'anatomie comparée des espèces dans la famille des Elatinacées*, etc.; B. E. Read and J. C. Liu, *Flora Sinensis: . . .bibliography of Chinese medicinal plants from the Pen Ts'ao Kang Mu* (from Mr. S. T. Dunn); T. Rocén, *Zur embryologie der Centrospermen* (from R. University Library, Upsala); *Field notes of some Rhododendrons collected by Rock in 1925 and 1926* (from Mr. Lionel de Rothschild); A. J. de Sampaio, *O problema florestal no Brasil em 1926* (in *Arch. Mus. Nac. Rio*, 1926); *Sander's Orchid Guide*, revised edition (from Mr. F. K.

Sander) ; V. V. Sapozhnīkov, *L'Altai Mongolien aux sources de l'Irtych et du Kobdo*, 1911 (in Russian) ; V. V. Sapozhnīkov and B. K. Shīshkīn, *Vegetation of the Zaisan District*, 1918 (in Russian) ; C. G. G. J. van Steenis, *Malayan Bignoniaceae : their taxonomy, origin and geographical distribution* ; B. Stefanov, (1) *Monographie der Gattung Colchicum*, 1926 ; (2) *Herkunft und Entwicklung der Vegetationstypen in den Rhodopen* ; T. R. Sim, *Tree planting in South Africa*, etc. ; W. N. Suksdorf, *Werdenda : Beiträge zur Pflanzenkunde*, Bd. i, nos. 1–4, 1923-27 ; E. Teixeira, *Oleos vegetaes Brasileiros*, ed. 2 ; B. C. Tharp, *Structure of Texas vegetation east of the 98th meridian*, 1926 (*Bull. Univ. Texas*, no. 2606) ; *Field notes on Rhododendrons collected by Kingdon Ward in 1926* (also *Field notes* on other plants collected by him in 1926, both volumes from Mr. Lionel de Rothschild) ; C. W. Wardlaw, *Lanarkshire Strawberry disease*, 1926 (from Major T. F. Chipp) ; J. H. L. Waterhouse, *A Roviana phrase book*, 1926 ; F. W. Went, *Wuchsstoff und Wachstum* ; Y. Yamamoto, *Supplementa Iconum plantarum Formosanarum*, pt. iii (from Department of Botany, Government Research Institute, Formosa). The year of publication when not stated is 1927.

The periodical and serial publications presented during the year include the following, which have been received from their editors or from the societies or institutions issuing them, unless otherwise stated :—*Acta Horti Botanici Universitatis Latviensis*, vol. i, no. 3, and vol. ii, no. 1 ; *Acta Instituti et Horti Botanici Tartuensis* (*Dorpatensis*), vol. i, fasc. 2-3 ; *Acta Phytochimica* (Tokyo), vol. ii, no. 4, and vol. iii, nos. 1–2 ; Angola, Fomento Geral (Fogerang), *Publicações diversas*, vi-ix (2 copies) ; Australasian Association for the Advancement of Science, Adelaide, 1924, *Report* ; Bernice P. Bishop Museum, Honolulu, *Report*, 1926 ; *Bothalia*, vol. ii, pts. 1a and 1b ; Boyce Thompson Institute for Plant Research, Yonkers, New York, *Contributions*, vol. i, no. 4 ; *Professional Papers*, nos. 3–6 ; British Association for the Advancement of Science, Oxford Meeting, 1926, and Leeds Meeting, 1927, *Reports* (Miss E. M. Wakefield) ; Leeds Meeting, *General Handbook*, with maps (Mr. W. B. Turrill) ; British Bryological Society, *Reports*, 1923-27 ; Brooklyn Botanic Garden, *Record* and *Leaflets* ; *Bulletin de l'Institut de Pédologie et de Géobotanique de l' Université de l'Asie Centrale*, Tashkent, livr. 1–2 ; *Bulletin du Jardin Botanique de Kieff*, livr. 5–6 ; *Bulletin of the Polytechnical Institute of Tiflis*, vol. i–ii ; *Bulletin of the Rubber Growers' Association*, vol. ix ; *Bulletin de la Société Botanique de Genève*, 2me série, vol. xviii, fasc. 2 and vol. xix, fasc. 1 ; *Bulletin de la Société Linnéenne de Lyon* (from Dr. A. W. Hill) ; Canal Zone Plant Introduction Gardens, Panama, *Report*, 1925-26 ; *Contributions from the Henry Shaw School of Botany*, St. Louis, Missouri, complete set, bound (from Prof. W. Trelease) ; *Contributions du Laboratoire de Botanique de l'Université de Montréal*, nos. 6–8 ; Danske Arktiske Station paa Disko, *Arbejder*, nos. 11–12 ; East Malling Research Station, *Annual Report* (13th year), Supplement ; *Empire Cotton Growing Review*, vol. iv ;

Erdészeti Kisérletek (*Forest Researches*), Sopron, Hungary, vol. xxviii, pts. 1–4, and vol. xxix, pts. 1–2; *Folia Cryptogamica*, Szeged, Hungary, vol. i, no. 4; *Forestry: the Journal of the Society of Foresters of Great Britain*, vol. i, no 1; *Indian Forester*, 1927; Indian Tea Association, Scientific Department, *Quarterly Journal*, 1926, pt. 4, and 1927, pts. 1–3; *Japanese Journal of Botany*, vol. iii, no. 3; *Journal of the Department of Agriculture of Porto Rico*, vol. xi (from Miss E. M. Wakefield); *Journal of the Federated Malay States Museums*, vol. xiii, pt. 4; *Journal of the Gold Coast Agricultural and Commercial Society*, vol. v, nos. 2–3, and vol. vi, no. 1; Long Ashton, Bristol, Agricultural and Horticultural Research Station, *Annual Report*, 1926; *Malayan Forest Records*, nos. 3–4; Marlborough College Natural History Society, *Report*, no. 75; *Mededeelingen uit het Phytopathologisch Laboratorium "Willie Commelin Scholten,"* Baarn, x–xi; *Mémoires de l'Institut de Génétique de l'École Supérieure d'Agriculture à Varsovie*, livr. 1–2; Milwaukee Public Museum, *Year Book*, 1925 and 1926 (from Mr. T. A. Sprague); Moss Exchange Club, *Reports*, 1903, 1904, 1908–19, 1921-22 (Mr. W. R. Sherrin); Nederlandsche Dendrologische Vereeniging, *Jaarboek*, 1926; *Nederlandsch Kruidkundig Archief*, 1926; *Notulae systematicae*, Herbier du Museum, Paris, tome iv, no. 3; *Nova Acta Regiae Societatis Scientiarum Upsaliensis*, ser. 4, extra volume, 1927; *Orchid Review*, 1927; *Quarterly Journal of Forestry*, vol. xxi and General Index to vols. xi-xx; *Recueil des Travaux Botaniques Néerlandais*, vol. xxiii, livr. 3–4, and vol. xxiv, livr. 1–3; *I Rocznik Polskiego Towarzystwa Dendrologicznego* (*Annuaire de la Société Dendrologique de Pologne*), 1926; Tohoku Imperial University, Sendai, Japan, *Science Reports*, ser. 4 (Biology), vol. ii, nos. 2–3; *Transactions of the Royal Society of Canada*, sect. v, ser. 3, vol. xx; *Transactions of Tomsk State University*, vol. 77, fasc. 1–4; *Travaux des Laboratoires de Matière Médicale . . de la Faculté de Pharmacie de Paris*, tome xvii; *Tropical Woods* (Yale School of Forestry), nos. 9–12; Ukraine Agricultural Scientific Committee, Botanical Section, *Journal of Agricultural Botany*, vol. i, pts. 1–3; Union of South Africa, Department of Agriculture, Veterinary Education and Research, *Reports* 11 and 12, in 2 parts; Forest Department, *Report*, 1925-26, and *Bulletins*, 17–19; Watson Botanical Exchange Club, *Annual Report*, 1926–27; *Welsh Journal of Agriculture*, vol. iii; Welsh Plant Breeding Station, *Bulletin*, ser. H, no. 5; Zionist Organisation Institute of Agriculture and Natural History, Tel-Aviv, Palestine, Agricultural Experiment Station, *First Report*, 1921–26.

Pamphlets, usually reprints from periodicals, include contributions from Dr. H. H. Allan, Mrs. Frank Bolus, Prof. V. F. Brotherus, Dr. P. Bugnon, Mr. B. F. Bush, Miss A. Camus, Mr. C. Cedercreutz, Mr. A. Chaston Chapman, Major T. F. Chipp, Dr. P. Choux, Dr. G. H. Cunningham, Prof. O. V. Darbishire, Prof. L. Diels, Mr. H. N. Dixon, Mr. Paul Dop, Mrs. E. Ekman, Mr. L. O. Gaiser, Prof. L. Hauman,

Dr. A. W. Hill, Prof. A. S. Hitchcock, Dr. D. Hooper, Mr. L. Lord, Dr. W. R. Maxon, Dr. G. Moesz, Prof. T. Nakai, Dr. C. H. Ostenfeld, Mr. L. R. Parodi, Mr. Perrier de la Bathie, Mr. T. Petch, Dr. H. H. Rusby, Prof. E. van Slogteren, Dr. W. Small, Dr. J. J. Smith, Mr. T. A. Sprague, Dr. J. Valckenier Suringar, Prof. T. Tanaka, M. I. Thériot, Dr. C. W. Wardlaw, Mr. C. T. White, Botanical Department, Birkbeck College, Pharmaceutical Society of Great Britain (Laboratory), Department of Mycology, Rothamsted Experimental Station, Botanical Department, Queen's University, Belfast, Botanical Laboratory, University of Utrecht, and the National Herbarium of Victoria, Melbourne.

The library is indebted to many societies, academies and other institutions in addition to those already mentioned for liberal contributions of their well-known publications and especially to the Royal Swedish Academy of Sciences, Stockholm; Botanic Garden and Academy of Sciences, Leningrad; Botanical Museum of the University of Zurich; Ministry of Agriculture, Egypt; Bureaux of Science, Agriculture and Forestry, Philippine Islands; Departments of Agriculture, Queensland, New South Wales and Victoria; New York Botanical Garden; Gray Herbarium and Arnold Arboretum of Harvard University; Missouri Botanical Garden; United States Department of Agriculture; Smithsonian Institution; California Academy of Sciences; and the University of California, including the College of Agriculture.

Mr. H. C. Sampson has presented the manuscript (98 ff., fol.) of a *Sketch of the botany of Kwangtung*, written by his uncle, the late Mr. Theophilus Sampson, who collected plants in China, many of which are now in the Kew Herbarium. Several original letters have been received from Mr. A. E. T. Long, of Richmond. These include three from Francis Buchanan to Dawson Turner (1806), Sir. W. J. Hooker (1820), and N. Wallich (1826), one from George Sinclair to Sir J. E. Smith (1818), and one from James Macfadyen to Sir W. J. Hooker (1838).

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Botanic Gardens, Brisbane.—
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Acclimatisation Society's Gardens, Lawnton.—
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Municipal Garden, Rockhampton.—
Superintendent—R. Simmons.

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Woods and Forests Department.—
Conservator—E. Julius.
University.—
Professor of Botany— ————————.
Botanic Garden.—
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Tasmania. Hobart.—
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Forestry Department.—
Conservator—L. G. Irby.

Victoria. Melbourne.—
National Herbarium (South Yarra).—
Government Botanist—F. J. Rae, B.A., B.Sc., B.Agr.Sc. *Senior Assistant*—J. W. Audas, F.L.S. *Assistant*—P. F. Morris.
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University.—
Professor of Botany and Plant Physiology—A. J. Ewart, D.Sc., Ph.D., F.R.S., F.L.S.

Western Australia. Perth.—
Department of Agriculture.—
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Department for Forests.—
Conservator—S. L. Kessell, M.Sc.

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Forestry Department.—
Conservator—B. R. Wood, M.A.

BRITISH HONDURAS.

Forestry Department, Belize.—
Conservator—J. N. Oliphant, M.B.E., B.A. *Agricultural Officer*—H. P. Smart.

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CANADA.

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Department of Agriculture.—
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National Herbarium, National Museum of Canada.—
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Department of the Interior.—
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New Brunswick. Fredericton.—
Department of Lands and Mines.—
Chief Forester—L. S. Webb.

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University of Manitoba.—
Professors of Botany—A. H. R. Buller, D.Sc., Ph.D., LL.D., H. F. Roberts.
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University of British Columbia, Vancouver.—
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SARAWAK.

Kuching.—
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SOUTH AFRICA.

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Department of Agriculture.—

Division of Botany, Horticulture and Entomology, Pretoria.—

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Bolus Herbarium.—

Curator—Mrs. F. Bolus, B.A. *Assistants*—N. S. Pillans, Miss L. Guthrie, Miss I. Arbuthnot, Miss M. Lavis. *Artist*—Miss B. O. Carter.

Municipal Gardens.—

Director of Parks and Gardens—A. W. v. d. Houten.

Stellenbosch.—

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Grahamstown.—

Albany Museum.—

Hon. Curator of Herbarium—R. A. Dyer, M.Sc.

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Port Elizabeth.—

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Curator—H. Rutter*.
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Transvaal Province.—
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INDIA AND BURMA.

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† Officers of the various Departments will be found under the Provinces and Administrations to which they are attached.

INDIA AND BURMA.—*contd.*

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INDIA AND BURMA.—*contd.*

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INDIA AND BURMA.—*contd.*

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